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**Examining the dynamics shaping water access for rural and peri-
urban areas in the region of Moretele, North West Province,
South Africa**

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Declaration

I declare that this thesis is my own, unaided work. It is being submitted for the degree Master of Science at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.



Signature of candidate

26 August 2019

Date

Dedication

I would love to dedicate this to the memory of Bra Moses 'Moshe' Mosweu, who we loved, and we will always remember.

So long, BIG Moss!!

(1972-2000)

♪ *Shena - Let The Beat Hit 'em* ♪

Abstract

The Constitution of South Africa affirms all the citizens the right to water access, but there are some communities in the rural and peri-urban areas such as the ones in the Moretele region (North West) without stable and reliable modes of water access. This echoes wider scholarship that argues that in a democratic South Africa, inequalities in water service delivery still run deep. In Moretele, the lack of reliable water access has been a problem that has been persistent, and it has not been clear how the associated institutions have adequately addressed this over time. Through the lens of political ecology and water governance, this study examined the dynamics shaping water access in the region of Moretele. Its multi-site design included three Moretele villages (Makapanstad, Ngobi and Carousel View) which shared the same Water Service Authority (WSA), the Moretele Local Municipality (MLM), and Water Service Provider (WSP), the City of Tshwane (CoT). A qualitative approach combined document review together with observations, structured and semi-structured interviews to collect data from resident households and the relevant institutions. The findings reveal that groundwater was and is still the most common source of water in Makapanstad and Ngobi while Carousel View receives reliable reticulated water supply from the MLM. This uneven water provisioning within the same municipality reflects particular challenges and slow progress around upgrading bulk water infrastructure and borehole infrastructure. Communication between authorities and residents around these challenges has been limited. Until these function at an optimum level, residents of more rural settlements in the Moretele continue to use multiple strategies to meet their water needs, in the absence of more reliable provisioning by the relevant water authorities.

Keywords: Rural and Peri-Urban Areas, Service Delivery, Water Access, Municipalities, South Africa

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Lastly, I would like to thank my family for the understanding and the support that they have given me through the journey.

List of Acronyms

BPDM	Bojanala Platinum District Municipality
BWSS	Bulk Water Supply Schemes
CoT	City of Tshwane
DPSA	Department of Public Service and Administration
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
ENSO	El Nino Southern Oscillation
FBW	Free Basic Water
GEAR	Growth Employment and Redistribution
IDP	Integrated Development Plan
IWRM	Integrated Water Resources Management
KWTP	Klipdrift Water Treatment Plant
MDGs	Millennium Development Goals
MLM	Moretele Local Municipality
MW	Magalies Water
NRF	National Research Foundation
PPVM	Protest and Public Violence Monitor
RDP	Reconstruction and Development Programme
TWPP	Temba Water Purification Plant
WMA	Water Management Area
WSA	Water Service Authority
WSP	Water Service Provider

List of Figures

Figure 1: Accountability Relationships in Service Delivery.....	22
Figure 2: Map of the municipalities in the North West province with Moretele Local Municipality in the top right corner	35
Figure 3: Map of the Moretele region showing some of its surroundings and research sites pointed in red dots (Makapanstad, Carousel View and Ngobi villages)	35
Figure 4: Rough composition sketch of Makapanstad.....	38
Figure 5: Makapanstad T-junction; separating the north, south and the west of the village.....	39
Figure 6: Road from heading into the western end of the village	39
Figure 7: Potoane Road heading to the eastern end of the village	40
Figure 8: Tshwane River in the north part of Makapanstad village	40
Figure 9: Map of Makapanstad village in relation to its neighbouring settlements	42
Figure 10: Map of Carousel View in relation to its neighbouring settlements	43
Figure 11: (A) Carousel View's RDP Houses with pit toilets on the side in. (B) One of the streets in Carousel View.	44
Figure 12: Rough composition sketch of Carousel View	46

Figure 13: Map of Ngobi village in relation to neighbouring settlements	48
Figure 14 (A) A Street in Ngobi village and (B) photo showing the beach-like sandy loam soil from Ngobi village	49
Figure 15: Rough composition sketch of Ngobi.....	51
Figure 16: Advertisement of drilling borehole water (A & B). Water being drilled in the home one of the participant (C &D).....	73
Figure 17: A water tanker delivering water to a water point in Makapanstad	76
Figure 18: A water truck at a water point in Makapanstad pouring the water into stationary tank	76
Figure 19: Makapanstad water reservoirs	82
Figure 20: Neglected (A) and vandalised public water infrastructures (B)	83
Figure 21: Public standpipe without a valve (A).Household water tap without a valve (B). Plastic tap in one of the households' yards in Makapanstad (C)	83
Figure 22: Burned public water tank as a result of the water protests.....	84
Figure 23: Railway separating Carousel View (right of the railway) and Bosplaas East (left of the railway).....	89
Figure 24: A yard in Carousel View displaying a tank to store water, a water tap and meter	91
Figure 25: Standpipes in front of Carousel Hotel (A & B)	92

Figure 26: Plastic swimming pool connected to a household tap (A). Planted fruits and vegetables respectively (B & C).	93
Figure 27: Functioning public tap connected from the public borehole structure (A). Public borehole structure (B). Household tap connected from the public borehole structure (C).	98
Figure 28: One of the extraction stations situated in the forest north of Ngobi and Transactie (A&B)	99
Figure 29: Transactie reservoir plant structure (A). The machine used to purify the extracted borehole water (B).	99
Figure 30: Functioning borehole water tap with a stand inside on of the yard of the participants (B): Household tap connected to public borehole standpipe, but now has not water coming out (B).	100
Figure 31: Through dug wells water is accessed in Ngobi (A, B, C &D)	102
Figure 32: Lined-up water tankers, collecting water from a hydrant in outside TWPP.	111
Figure 33: The location of the Leeukraal\Kudube Dam on a topographic map (B)	114
Figure 34: Aerial view of the TWPP in Kudube Hammanskraal.	115
Figure 35: The expansion of the TWPP	116
Figure 36: Released separated waste sludge water from the TWPP (A&B).....	119

Figure 37: A proposed scope of the water supply by the MW to the Moretele region 121

Figure 38: A proposed scope of the water supply by the MW to the Moretele region 122

List of Tables

Table 1: Demographic statistics of the three villages together with MLM as a whole	36
Table 2: Interview demographics and details from case villages	54
Table 3: Interview details from institutions	55
Table 4: Water sources and access in Makapanstad village over different periods (1994-2017)	69
Table 5: Water sources and access in Carousel View village over different periods (1994-2017)	87
Table 6: Water sources and access in Ngobi village over different periods (1994-2017)	95
Table 7: Volume and costs of bulk water supplied to the Moretele Local Municipality by the City of Tshwane Municipality (taken from information provided by a CoT official)	109
Table 8: Current, future and ultimate flow distribution from TWPP	117

Table of Contents

Declaration.....	ii
Dedication.....	iii
Abstract	iv
Acknowledgements	v
List of Acronyms	vi
List of Figures	vii
List of Tables	xi
Table of Contents	xii
Chapter 1: Introduction	1
1.1. Introduction.....	1
1.2. Background	1
1.3. Problem statement	2
1.4. Research Aim	3
1.5. Research Question	3
1.6. Research Objectives	3
1.7. Outline of the thesis.....	4
Chapter 2: Literature Review.....	7
2.1. Introduction.....	7
2.2. Water resource availability and challenges: South Africa in global perspective	8
Global water challenges.....	8
Sub-Saharan Africa water challenges.....	8
South Africa water challenges	9
Water infrastructure needs serious attention in South Africa	10
Water challenges are multifaceted	11
2.3. The legacy of apartheid on the uneven provision of water in South Africa.....	12
2.4. Early water policy and constraints in the democratic government	13
2.5. Debates around FBW, privatisation and justice in post-apartheid water provision.....	14
2.6. Building on the free basic water supply policy	18
2.7. Service delivery in South Africa	19
2.8. Towards achieving quality service delivery	22
2.9. The duties and obligations of the government and water institutions	24
2.10. The concept of water governance	26

2.11. Political ecology as an approach to understanding water injustice in South Africa	28
2.12. Conclusion	31
Chapter 3: Methodology.....	33
3.1. Introduction.....	33
3.2. Positionality	33
3.3. Study Sites	34
3.3.1. The context of the Moretele region.....	34
3.3.2. The context of Makapanstad	36
3.3.3. The context of Carousel View	43
3.3.4. The context of Ngobi village	48
3.4. Methodology	51
3.4.1. Qualitative approach	51
3.4.2. Multi-site case study research.....	52
3.5. Sampling methods	52
3.5.1. Non-probability sampling	52
3.5.2. Sampling the three case villages in the Moretele region.....	52
3.5.3. Sampling methods within the villages (Makapanstad, Carousel View and Ngobi).....	53
3.5.4. Sampling methods for the MLM (WSA) and the CoT (WSP)	54
3.6. Data collection	56
3.6.1. Structured interviews for the villages	56
3.6.2. Semi-structured interviews for the institutions	57
3.6.3. Observation	58
3.6.4. Document Review	59
3.7. Data analysis	60
3.8. Ethical Considerations	62
3.9. Limitations	64
3.10. Conclusion	64
Chapter 4: Results	66
4.1. Introduction.....	66
4.2. The context for dividing the periods for data collection	66
4.3. Makapanstad case study.....	68
4.3.1. Introduction and overview	68
4.3.2. Different water sources people of Makapanstad use.....	71
4.3.3. Water challenges faced by the people of Makapanstad	77
4.3.4. Water advantages associated with Makapanstad	80

4.3.5. The state of Makapanstad water infrastructure.....	81
4.3.6. Residents' relationship with the municipality around water	84
4.4. Carousel View case study	86
4.4.1. Introduction and overview	86
4.4.2. Different water sources people of Carousel View use	88
4.4.3. Challenges related to municipality treated water in Carousel View	91
4.4.4. Water advantages associated with Carousel View.....	93
4.4.5. Residents' relationship with the municipality around water	94
4.5. Ngobi case study	95
4.5.1. Introduction and overview	95
4.5.2. Different water sources people of Ngobi use	96
4.5.3. Water advantages associated with Ngobi.....	103
4.5.4. Water Challenges faced by the people of Ngobi	103
4.5.5. Residents' relationship with the municipality around water	104
4.6. Local Water Institutions (MLM & CoT)	106
4.6.1. Introduction	106
4.6.2. North West province hydrological infrastructure.	106
4.6.3. The relationship between the institutional water actors	107
4.7. Moretele Local Municipality's role in supplying water to the Moretele region...	108
4.7.1. The manners in which the Moretele Local Municipality supplies water to the communities.....	109
4.7.2. Challenges faced in relationship between the municipality and the community	112
4.8. City of Tshwane role in supplying water to the Moretele region	112
4.8.1. The origin of the received water	113
4.8.2. Water circulation	114
4.8.3. The Temba Water Purification Plant	114
4.8.4. Distribution of water	116
4.8.5. Problems related to the Temba water source.....	118
4.8.6. Associated challenges	120
4.9. Future of the water supply plans	120
4.10. Conclusion	122
Chapter 5: Discussion	124
5.1. Introduction.....	124
5.2. Interpreting comparative findings across the three village sites.....	124
5.2.1. General contextual similarities and differences.....	125
5.2.2. Water access similarities and differences.....	126

5.2.3. Municipal water as preferable but undependable	128
5.2.4. Commonality in groundwater use	129
5.2.5. Rain water as supplementary source in some villages	130
5.2.6. Differentiated relationships with the municipality	130
5.2.7. Lengthy developments to achieve water access	131
5.2.8. Water infrastructure not fully serving the people	133
5.2.9. Beyond supply: quality of the potable water accessed.....	134
5.3. Relating the comparative findings to the literature.....	135
5.4. The dependence on groundwater and other unimproved water sources forms is not by choice.....	135
5.5. Challenges hindering service delivery	137
5.5.1. Accountability is key in ensuring water access	138
5.5.2. Public Participation and access to information.....	139
5.5.3. Water developments require capital but from where?	141
5.5.4. Historic underinvestment in maintenance and upgrading of water infrastructure	143
5.6. A closer look at the governance of water.....	146
5.7. Has water access made justifiable strides?.....	147
5.8. Political ecology of water access.....	148
5.9. Analytical reflection	150
5.9.1. The choice to expand the project	150
5.9.2. Different villages require different approaches	151
5.9.3. Chasing the related institutions.....	152
5.9.4 Journey to remember.....	153
5.10. Conclusion	154
Chapter 6: Conclusion.....	156
6.1. Summary of research objectives and research undertaken.....	156
6.2. Summary of main arguments and contribution to the literature	157
6.3. Recommendations for further research.....	159
6.4. Conclusion	161
Chapter 7: References	162
Chapter 8: Appendices	178
8.1. Appendix of data collection instruments for village participants	178
8.2. Appendix of data collection instruments for institutional participants	184
8.3. Appendix of ethics approval documents.....	196

Chapter 1: Introduction

1.1. Introduction

The issue of water access in South Africa is a problem that has many layers that need careful analysis. The access to water is an ongoing issue in rural communities. The literature review will help in giving us an understanding of the processes involved at the institutional level in ensuring equitable water supply. Therefore the study looked to understand the networks of water supply associated with communities in the region of Moretele, just north of Tshwane in the Northwest Province. Understanding how the communities experience water access formed the basis in approaching the associated municipalities and the water suppliers about their roles in ensuring water access in the communities. Information from three selected communities in the Moretele region, the involved municipalities and the City of Tshwane (CoT) was used to understand and analyse the dynamics shaping water access for the communities in the Moretele region. Qualitative research methods were applied to collect needed information to fulfil the research question.

1.2. Background

Water access plays a critical role in making sure that there is an achievement of the Millennium Development Goals (MDGs) such as eradicating extreme poverty and hunger (Lewis and Yacob 2004). The section 27(1) (b) of the South African Constitution states that all South African citizens have the right of access to adequate food and water (Republic of South Africa, 1996). Also in section 27(2) of the Constitution (1996), the state has the authority to take governmental actions, in their capacity, to attain the realisation of these rights (Republic of South Africa, 1996). It is important to realise that access to water plays an essential role in making sure that people can improve their lifestyle. Still, some communities in the Moretele region do not have stable and reliable modes of

water access. Critical to this research was to find out what role the municipalities and affiliated water institutions within the state's capacity play in the rolling out of water service in the Moretele region.

1.3. Problem statement

The problem is that after many years, communities falling under the Moretele Local Municipality (MLM) in the Bojanala Platinum District Municipality (BPD) have not had consistent and tangible access to water supply. My previous work on Makapanstad (for honours), which is one of the villages in the Moretele region, began to explore how in everyday practice, people rely on different methods of accessing water. My honours project was looking at the variety of sources used in the village such as rain harvesting, borehole water or the supply from the municipality (in the form of standpipes, tankered water and reticulated water in their yards). How this compared to other villages' experiences in the region was unknown. The hunch was that there is no stable water supply for the communities under the umbrella of the MLM. A comparative approach to understanding the dynamics shaping water access in the region of Moretele across these different distances and development levels is essential. When I talk about dynamics, I refer to the underlying processes which shape water access in the Moretele region.

Rural municipalities more generally are faced with a problem of providing services to communities as required by the Constitution (Mothetha et al., 2013). It is further stated more work and effort is required to make sure that the role of providing services are in place and that there is an achievement of the goal of ensuring access to water services as expected (Mothetha et al., 2013). Furthermore, potable municipal water supply is crucial in supporting the needs of the community as most other water sources have complications. For example, an argument can be made that borehole water is expensive to develop, and that rain

harvesting is unreliable (Vyas, 1995). Getting the accounts of the role players involved is essential.

The research contributes to the literature on water, in particular, understanding access from the consumers and supply from the institutions' point of views. Finally, this will help to understand the state of water and what measures can be taken to improve this. Furthermore, the study uses a political ecology approach to understand these dynamics in more interrelated and context-specific ways, rather than simply as 'natural' or 'technical' problems.

1.4. Research Aim

The study aims to examine the dynamics shaping water access for rural and peri-urban areas in the region of Moretele.

1.5. Research Question

How can we understand the dynamics shaping water access in the region of Moretele and the actions in place to improve water access?

1.6. Research Objectives

To answer this question, my research objectives were threefold:

1. To document historical and current water access in the three selected places in the Moretele region (Makapanstad, Ngobi and Carousel View) and the efforts of the community in ensuring access.
2. Examine the networks of water supply between the involved municipalities, associated water institutions and places in the Moretele region.

3. To explore the role of the relevant municipalities and relevant water institutions in ensuring water access in the Moretele region.

1.7. Outline of the thesis

The first chapter that follows is the literature review, which captures relevant scholarship around the provision of water and access to water in South Africa. Various debates are covered, looking at different aspects of water ranging from the Global South and to the context of South Africa. Specifically looking at South Africa, the literature accounts for the role of policy approaches regarding water service delivery among other basic services. Different scholars review how water access has changed from the pre- to post-apartheid era and how the policies had to be amended in democratic South Africa. They also faced struggles in order to afford the right of access to sufficient water for all citizens. Subsequently, active response to water provision has been questioned extensively in regards to privatisation of water in the country and service delivery in general. At the heart of this research project, political ecology makes us aware of the relationship between politics, economy and society regarding water. This approach highlights the structural injustice currently occurring in South Africa regarding the poor: various literature are reviewed to emphasise the gap this project looks at to understand the dynamics shaping water access in the rural and peri-urban areas.

Following the literature review chapter, is the methodology chapter, which describes the experience of the research and the methodological process. I start by giving the context for the different sites of the data collection in the Moretele region and the actual sample groups involved. I introduce the background of the Moretele region, the related villages in the research—Makapanstad, Carousel View and Ngobi—looking at their history and their existence. In terms of research design, qualitative and multi-site case study research is used as the research collects data from different settings. In understanding the water access situation in the region, multiple data collection methods were employed. These primarily involved structured and semi-structured interviews with residents from the three

villages and with state officials in different institutions. To give validity to the conducted interviews, observations and document review involved reviewing proposed structural water plans and physically observing the water situation on the ground from the villages' standpoint and from the institution's point.

The results chapter share the results of my analysis of the collected interview and observational data from the three case villages and relevant institutions. This begins by detailing water access experiences past and present in the three selected villages in the region in the form of Makapanstad, Carousel View and Ngobi. This is where we get the ground level sense of the nature of the water situation in the region over time and an understanding of the different modes of access and relationship with the state around water. The analysis of the villages is followed by analysis of data collected from MLM and CoT on how they administer water supply.

Having analysed the results of the study, the discussion then interprets the significance of what was found. The discussion starts by talking across the cases; contextualising the differences and similarities outlined from the study. These differences range from the modes used to access water to the relationships participants have with MLM. The second part of the discussion integrates the literature; this is where there is an integrated discussion between results and literature from other scholars in different places concerning water access. The chapter also reminds us of the aims and objectives of the research to demonstrate what the collected data means to the overall study. At the end of this chapter there is an analytical reflection on the research journey. The thesis concludes that residents of MLM in BPDM have not had consistent and tangible access to water supply over the years and the current supply does not meet the goal of the 'right to water'. There has been a lack of synergy between the community and the MLM. The uncertainty around the water in the region has not adequately been addressed. Notably, there has been a lack of urgency from the authorities to ensure that the

planned water infrastructure functions at an optimum level to supply communities in the Moretele region with water.

Chapter 2: Literature Review

2.1. Introduction

This chapter aims to carefully examine various relevant literature associated with water access in South Africa and rural areas in particular. The chapter starts by looking at some global water challenges, then mirroring that with the Global South water situation and finally looking at the South African context. With the focus being South Africa, the literature goes back to assess how the history of apartheid has had an impact on past and present water access in the country. Following the assessment of the impact of apartheid on water, I then discuss the early constraints that the democratic government was faced with in the provision of equitable water access in the 1990s. From the 2000s, the literature takes us into debates about water justice, touching on free basic water policy (FBW) and privatisation and showing how the water landscape in South Africa continued to progress through the interchanging ministries. I then zoom out to wider discussions of service delivery in South Africa and specifically how water service delivery has progressed in South Africa and how that can improve. As the Constitution of South Africa has said that water service is the duty of the government, I outline the literature highlighting the roles of the relevant institutions in making sure that there is just water access to the community. Water governance literature informs us of how better governance of water can be achieved through transparency and accountability. I conclude with the literature around the political ecology of water that emphasises the link between society, politics, economy and that in order to move past the water injustices in South Africa, there has to be structural change.

2.2. Water resource availability and challenges: South Africa in global perspective

Global water challenges

Many places around the world struggle with water challenges. Van der Bruggen et al. (2010) share some of the factors, suggesting that apart from climate change, there is firstly population growth in the world, secondly there is little infrastructure and lack of investment in infrastructural facilities, and lastly in other places there is limited amount of natural water resources available. The projected world population for 2050 is expected to be 9.3 billion and 418 million of these people will be coming from countries already experiencing water scarcity (Bernstein, 2002). Over 700 million people in the world do not have access to potable water; this number will reach three billion by the year 2025 (Glenn et al., 2007). Notably, people in the rural areas of developing countries have been waiting for the 20th-century modern-day developmental promise to be provided with potable water (Birkenholtz, 2016) but continue to face the challenge of collecting water from public standpipes (Jackson and Sultana, 2016).

Sub-Saharan Africa water challenges

Water and sanitation are human rights essentials, but when it comes to Sub-Saharan Africa, it is reported that around 42% of the population are without basic water supply and further 72% lacking basic sanitation (GIZ, 2019). The water access and sanitation challenges in sub-Saharan Africa are not just scientific and technical in nature, but co-produced by factors of environment, human behaviour, culture and economics (Armah, et al., 2018). In Sub-Saharan Africa, water-related challenges put pressure on economic growth and the livelihoods of the people (WWAP, 2016). There are still significant challenges lying ahead for rural Sub-Saharan Africa concerning access to clean water (Mutamba 2014). It is particularly so in isolated poor rural communities where piped-water systems are mostly uneconomic to install (Mutamba 2014). In Porto et al., (2007), the estimation is that one-third of the population of the third world will be facing

extreme water scarcities by the year 2025. Across the world, there about a tenth of people are living without access to potable water. Looking specifically at the developing countries, Sub-Saharan Africa is affected the most, with substantially more of its population without access to clean water when compared to other regions in the world (Porto et al, 2007).

South Africa water challenges

Kohler (2016) reminds us that South Africa does not have adequate water. In the world South Africa is ranked as the 30th country in desperate need of water, receiving precipitation of just 450mm annually (Kohler, 2016). South Africa is a water stressed country with an annual average rainfall of annual 450mm which is below half of the world annual average of 860mm (DWA, n.d.). In the study conducted by Jury (2018), it is reported that the rainfall trends between 1980-2014 have shown that there have been small rises noted throughout the interior while there have been drying trends in the southwest coastal mountains of Cape Town and also near Polokwane. The rainfall fluctuation is overshadowed by inter-annual variations associated with the El Nino Southern Oscillation (ENSO) (Jury, 2018). When compared to the world average, South Africa has low levels of rainfall as a result of the high variability and high degree of evaporation because of the hot climatic conditions (Schreiner et al., 2018). Climate change threatens to have a severe effect on the water resources in South Africa, which will, in turn, impact food security, the health system, infrastructure, ecological system services and biodiversity. Bearing in mind South Africa's high levels of poverty and inequality, these effects pose serious challenges for national development (Ziervogel et al., 2014). Water inadequacy, poor quality of water and undependable water access pose a threat to the production of staple food crops at the level of both subsistence and commercial (Wright, 2015). According to Stats SA by 2017 there were 88.6% of households with piped water (Stats SA, n.d).

Water infrastructure needs serious attention in South Africa

In addition to the water challenges above, water infrastructure maintenance and investment are factors that affect water supply, and need attention so that water does not get wasted and that there is a sufficient supply of water in affected places. Effective and productive infrastructure services are essential contributions for all industries and therefore crucial for progression of the economic and efficacy, productivity and competition as a whole (Ruiters, 2013). According to Van der Bruggen et al. (2010), insufficient, under-funded or below par maintenance of water infrastructure is a critical aspect causing the unpredictable water availability which occurs in many areas in developing countries (Sullivan, 2003). The importance of infrastructure has been single-handedly explained in the MDGs to be the essential target that was needed to be achieved by 2015. In South Africa, the need for maintenance and investment was noted by the National Treasury (2011b) as one of the factors influencing the efficient distribution of water services; under-investment in the maintenance and renewal of infrastructure is reflected in the failure in service delivery around South Africa. A considerable number of technical water losses as a result of pipe bursts and leakages lead to substantial revenue losses for municipalities, and that lost revenue could be used for added maintenance (National Treasury, 2011b). However, there is no data on the actual expenditure on maintenance spent by municipalities (National Treasury, 2011b).

Water provision is also hampered by the shortage of skills (National Treasury, 2011b). It was pointed out by the Deputy Director General of Department of Water and Sanitation (DWS) Trevor Balzer, that South Africa is facing a crisis of declining water quality, lack of maintenance and investment in water infrastructure, recurring droughts, imbalances in the right to access to water and sanitation, and a shortage of skilled water engineers. The listed challenges already have substantial effects on the economy (Pettersson, 2018). The water sector is currently suffering an extreme lack of critical skills that include experienced engineers, water researchers, technicians and artisans. The lack of skills has

proven to be a challenge in the sector in the effort to effectively provide water. The civil engineering capacity of engineers per 100 000 individuals has proved to be low in delivering, operating and maintaining the local government infrastructure sustainably (National Treasury, 2011b).

Water challenges are multifaceted

In the context of South Africa, Mahlanza et al. (2016) explain the problems of water supply and access through two categories: physical and economic water scarcity. Physical shortage occurs when the existing water reserve fails to accommodate at least the minimum requirements (Mahlanza et al., 2016). Economic water scarcity happens when the ‘water bodies’ allocate water to the sector of the society that can afford to pay for it at the expense of those who cannot pay for the water. It is then argued that the legal allocation standard of 6 000 free litres per month (see section 2.5) would underserve the poor communities with water supply (Mahlanza et al., 2016).

Bakker (2007) says that this unequal allocation of water is an infringement on human rights, whereby the critics of the human rights doctrine debate that this ‘talk about the right to water’ comes from an individualistic, libertarian viewpoint that is ‘Eurocentric’. Privatisation refers to the transfer of ownership of water supply from state entities to private systems, and has worked well in some utility sectors and not worked in others (Bakker 2007). Jackson and Sultana (2016) also argue that the technocratic manner in which water is conceptualised may worsen the problems of scarcity discussed here. Even though the argument could be that privatisation brings efficient improvement and better water management; there are those who strongly critique this, arguing that neo-liberalism brings about an act of deprivation. The privatisation of water can make life difficult for the poor (Mobie and Masango, 2009). These effects are also spatially uneven: according to Budds and McGranahan (2003, p.111) “peri-urban and rural areas are almost always excluded from private contracts”.

2.3. The legacy of apartheid on the uneven provision of water in South Africa

It is pointed out in Earle et al. (2005) that under the apartheid government, government programmes were designed to service the needs of the select few. In this regard, water service was no different from the rest of the services if not worse (Earle et al., 2005). Water resources were developed to assist the privileged white minority - while leaving poor black areas underdeveloped (Earle et al., 2005). Furthermore, Bond (2009) makes the point that even though white households were more affluent than black households, water was something that white South Africans still had to pay less for, especially considering that they had one of the highest ratios of swimming pools in the world. On the other hand, black South Africans were susceptible to insufficient provision of water in the rural homelands and urban townships (Bond 2009).

The new democratic government was faced with the situation of about 12 million people without access to regular water supply (DWAF 1999). About 30% of the population was in dire need of adequate water supply with 50% also requiring adequate sanitation (Nnadozie 2011). The vast majority (75%) of those people were placed in the areas previously known as homelands, and 13% of that land was without water (Earle et al., 2005). The homelands or Bantustans were created in South Africa by the Government during apartheid, as areas to which the bulk of the black population was moved, as urban areas which were reserved for whites (SAHO, 2011). The idea was to make sure that blacks and whites were separated and for blacks to run their own independent governments. By denying blacks access into the urban areas, they were also denied protection and any lasting rights (SAHO, 2011). At the time no designated government department was devoted to the general distribution and administration of the water services in the country. In the homelands, the 'homeland governments' were in charge of running the service infrastructures and imperfectly depending on the National Party government for funding (Nnadozie 2011). Bond (2009) indicates that homelands did not have established water and irrigation infrastructures. Development was channelled to

the white urban and farming areas, and occasionally to a lesser extent to black urban townships.

2.4. Early water policy and constraints in the democratic government

The democratic South African government was faced with the challenge of fixing the neglect of the previous government by providing services in black communities, such as water access and housing. We can broadly trace two distinct periods in these early years of democracy vis-à-vis water provisioning: 1994-2000 which was a period of transition and policy making; and from 2000, where concerns about affordability became more prominent and after which responsibilities were devolved to local government. The post-apartheid government set up the Reconstruction and Development Programme (RDP) as the “policy foundation stone” of the democratic government (Nnadozie 2011, p.339). Through the RDP, the Department of Water Affairs and Forestry (DWAF) had the duty of safeguarding widespread access to basic water services for the people of South Africa regardless of their citizenship (Nnadozie, 2011). The DWAF drew up the ‘White Paper on Water Supply and Sanitation’ to provide a framework for government policy in providing access to this adequate supply of potable water (Dreyer, 1998). In the 1994 White Paper, the argument was that there was a need for public action in dealing with the undesirable water situation in South Africa, and it was proposed that action should be built on a clear policy about the rights of all citizens in determining their future (DWAF, 1994). In the constitution it was declared that South African citizens have the right to have access to adequate food and water and that is the responsibility of the government to ensure the progressive realisation of all these rights (Republic of South Africa, 1996).

South African water policy went through a period of constant changes (Karodia, and Weston, 2001). DWAF was established by the democratic government of South Africa in November of 1994 and later renamed DWA. From the 1994 White Paper, structures for water and sanitation services were set out, a 1997 water policy was developed and later established the Water Services Act (Dugard,

2016). The aim of the Water Services Act was to provide the national standards of norms on water, regarding among others the provision of water and sanitation, tariffs, governing framework, etc. (RSA, 1997). On the other hand the Water Act was set to ensure that the country's water resources are "protected, used, developed, conserved, managed and controlled" (RSA, 1997, p.9). Amongst others, it was set to meet the basic human needs of the current and future South African generations and also to promote equitable water access while rectifying the effects of the past racial and gender prejudices (De La Harpe and Ramsden, 1999). However, the government realised that many local authorities were not capable of providing basic water supply to the people who cannot afford it as per the obligation of the Water Services Act and Constitution (SAHRC 2001). In 2000 DWAF introduced the Free Basic Water (FBW) policy to ensure that no one is denied the right to access to water (SAHRC, 2001). There has been an active engagement by scholars with this state provisioning since, as the following sections discuss.

2.5. Debates around FBW, privatisation and justice in post-apartheid water provision

One of the key principles of the Water Act of 1998 is 'equity': "equity means that everyone must have access to water and to the benefits of using water. Decisions to allocate water must be equitable (fair) to all people" (De la Harpe and Ramsden, 1999, p.11). However, the government soon realised its policy on paper was not transcending to the reality on the ground and that people were going through difficult extreme measures to access water that was even not potable because they could not afford to pay for it (Hemson, 2000). For example, in a 2000 speech, the then Minister of Water Affairs and Forestry Ronnie Kasrils shared his experience as follows:

"I went down to see the borehole, on the banks of a dried out riverbed. There I found a young woman, with a three-week-old baby on her back, scooping water out of a hole she had dug in the riverbed. When I asked her why she was not using the taps, she told me she could not afford to do so. For those living in deep poverty, a US nickel is just too much to spend on

a day's supply of clean water. Recently, a research survey established that many poor rural women in South Africa feel that to spend R10 on clean water would be to deprive their children of food. So they choose to search for free, unsafe water instead” (Kasrils, 2001, p.1).

In designing a policy for the provision of the FBW services, Kasrils declared in February 2001 that government had made a decision that poor households get basic water supply for free (DWAF 2002). The South African cabinet approved to make available 6,000 litres of water for every household per month (DWAF 2002). The announcement by Ronnie Kasrils was also in accordance with the speech made by the former president Thabo Mbeki, that as an approach to eradicate poverty in South Africa, “the provision of free basic amounts of electricity and water to our people will alleviate the plight of the poorest among us” (Joseph, 2002, p.2).

The FBW policy has been controversial for various reasons. Some noted the policy was announced strategically the day before of local government elections (Muller 2008). The policy also conflicted with the common understanding during the time that water, “as an economic good, should be paid for” (Muller, 2008, p.67). Smith and Green (2005) also note the debate regarding the timing of the decision of FBW and the final amount of water offered. In regards to FBW policy, there have been two sides to the policy’s legitimacy; one group believes that FBW has come as a result of the attempt to reduce the accountancy costs and to permit imposed restriction strategies rather than to recognise the people’s right to water (Smith and Green, 2005). The other group believe that the FBW policy indeed aligns with the goals to relieve poverty and create gender equity and plays a role in decreasing household costs while promoting water security for needy families (Smith and Green, 2005).

This is related to broader debates on water’s value as a public or private good. In South Africa, pricing the supply of water and specifically whether people should

pay for water is a question that is complicated and often clouded by politics. Water is a resource that holds different meanings, “those of a resource essential for life, those of a productive or of a luxury consumption nature and those of a limited environmental resource” (Muller, 2008, p.74). Regardless of its use, supplying water to the people is a complex task that takes into account the cost which requires funding strategies to sustain the supply of water (Muller, 2008).

There are those who argue that for people to be provided with sustainable access, there has to be a monetary value put to it to ensure better management. Consequently, the privatisation and regulation of water can progress access to safe, dependable and realistic prices for water (Alseaf, 2017). The private sector’s motive is to attain the best profit at the lowest cost. The water infrastructure in developing countries is sometimes outdated; therefore water infrastructure are vital to providing clean water to people, and the solution to the problem could be 'privatisation' (Vandermyde, 2015). Privatisation aims to improve the social objectives which were set to be accomplished by government projects while also creating jobs. Amos (2004) believes that better autonomy and accountability for service providers can be achieved by separating the responsibilities of policy and guideline from tasks such as the ownership of assets, corporate administration, and service provision. The problem is that some countries still use the traditional direct public management model, whereby there is a concentration of all the duties of asset ownership and service provision in a department or ministry (Amos, 2004).

Some scholars argue against the privatisation of water saying that approaching water as a commodity and not a public good does not always result in justifiable water access (Bayliss, 2002; Bakker, 2007). As reported in Barlow (2006) highlighted that charging of high water tariffs, cutting off water service of those who cannot afford to pay, substandard services, empty promises and pollution have all been the legacy of water privatisation. Galvin (2016) highlighted that the government used disconnections as a credible mean of halting the provision of water to people

who do not pay their water bills. Similar findings have come from South African scholarship on water privatisation (Bond 2009); Ange, and Loftus, 2017; Clark, 2017).

Of specific interest is the worry that over the years the RDP has swiftly been moved to the market-oriented Growth Employment and Redistribution (GEAR) programme; the argument is that this move has created further structural injustices in the delivery of services (Smith, 2002). What is ironic is that RDP was the programme that was established to foster service delivery in areas such as rural areas. The neo-liberal policies associated with new development policies in an attempt to improve service delivery continue to produce inequalities through privatisation and commodification of water (Narsiah, 2002; Hellberg 2017). Bond (2005) argues that neo-liberal policies have intensified the economic contradictions of apartheid rather than resolving them. The argument made is that neo-liberal policies have just replaced the apartheid's regimes of racial segregation regime with class segregation (Harvey, 2007; Kemerink et al., 2011). According to Washburn (2012, p.49) "GEAR was the first step of many to commoditise water and privatise the public sector"; GEAR positioned the policies on water and other basic needs in a neo-liberal context (McKinley, 2005). The result of the neo-liberal economic advice from the World Bank, the IMF, other western countries and the push for privatisation by companies such as Suez and Biwate pushed the government to cut grants to local municipalities and councils (McKinley, 2005). In turn they supported the development of financial implements for privatised service delivery (McKinley, 2005). This meant that at the end of apartheid around 1993 some of the black settlements in Eastern Cape like Fort Beaufort were charged a flat rate of R10,60 for collective services which included water and waste removal. Moving into democracy with the introduction of privatisation, there was an increase in the services charges by 600% to R60 per month (McKinley, 2005). The collective influence of the privatisation of water on most of the South Africans was overwhelming (McKinley, 2005).

2.6. Building on the free basic water supply policy

After the establishment of the FBW in South Africa, there were a number of other developments that followed suit to strengthen water and sanitation provision. Minister Buyelwa Sonjica played a role in setting into motion the development of the Municipal Infrastructure Grant (MIG), which was completed in 2003 (WRC, 2014). MIG funds may be used to improve and construct new infrastructure at a basic level of service as well as to refurbish existing infrastructure, as long as that the infrastructure provided basic services for the poor (DPLG, n.d.). Sonjica also during her tenure of 2004- 2006 acknowledged campaigns to do away with the bucket system and made substantial progress on that (WRC, 2014). By 2006 when Minister Lindiwe Hendricks took over, she was faced with many challenges, including the cholera outbreak in Limpopo in 2008 and tracing backlogs in access to infrastructure. There was a stage when the cumulative backlog or deficit was R10.1 billion for operations and maintenance of water resources infrastructure in South Africa (Ruiters, 2013). However, on the positive side, it was during her tenure that cabinet accepted the application of phase two of the Lesotho Highlands scheme to provide water to Gauteng province and the rest of the Vaal River area (WRC, 2014).

Challenges seem to have increased in the water landscape of South Africa when Edna Molewa took over from Sonjica who returned for a short stint. These challenges included the likelihood of fracking in South Africa, how the municipal infrastructure functioned and provision of sustainable service delivery (WRC, 2014). The minister that followed was Nomvula Mokonyane, who mentioned that municipalities must make sure that the administration and maintenance of infrastructure should be undertaken as their budgets stipulate (WRC, 2014).

Old continuities compound these new trends towards commodification: even though we have moved away from apartheid, the system of injustice in the manner in which service delivery is conducted has similarities with the past. Even though we have moved away from apartheid, the system of injustice in the manner in which service delivery is conducted has similarities with the past. Loftus (2009) argues that the physical infrastructure from which households in Durban water supply reflects the continuous burden of people denied access to water. As a result, the installation of taps in the yards of township households became the basic method of ‘water access’ and not the advanced technology used in suburban households which accommodated a lot of household activities (Loftus 2009). Loftus (2009) agrees with Smith (2002) by saying that this legacy has continued in the post-apartheid era creating structural injustice. Therefore this kind of injustice becomes the foundation shaping the water supply challenges such as lack of skills at municipalities, poor operation and maintenance of infrastructure, illegal connections and political interferences (Mothetha et al., 2013).

2.7. Service delivery in South Africa

The dawn of democracy brought hope for a better quality of household life and better-quality service delivery for the bulk of South Africans who found it hard to survive under apartheid. Subsequent to this, during the 1997–98, the Department of Public Service and Administration (DPSA) issued the White Paper on Transforming Public Service Delivery that provided the eight values known as Batho Pele Service Delivery Principles (Sithole and Mathonsi, 2015). Here the public sector was given principles to follow in making sure that the goods and services are provided to citizens (Sithole and Mathonsi, 2015). According to Chen et al. (2014), in South Africa, the term ‘service delivery’ is a common word used to define the delivery of basic needed resources to people.

In South Africa one of the key strategies for alleviating poverty has been strengthening basic service delivery. The statistics have shown that there has been relative success when it comes to the provision of electricity and piped water, compared to water-borne sanitation (Butcher, 2019). Even though a large number of South African households have access to piped water, a substantial section of households, especially those in the rural municipalities, are forced to be dependent on other sources of water (Stats SA, 2016). By 2016, 1.7 million of households (8.8%) in South Africa did not have access to piped water (Stats SA, 2016). By 2017 88.6% of households in South Africa had access to piped water, while provinces like Eastern Cape and Limpopo had 74.7% and 74.2% respectively (Stats SA, 2017).

In South Africa since 2012 there has been an improvement of 20.5% of households with access to sanitation as a result of the efforts of the government and its support agencies (Stats SA, 2017). Sufficient access to proper sanitation is essential to the health of the citizens that is the reason why the government aims to increase the percentage of household with sanitation to 90% in 2019 (Stats SA, 2016). The number of households with no sanitation and those using the bucket toilet system has dropped from 12.6% in 2002 to 3.1% in 2017 (Stats SA, 2017). Although this is the case, only 63.3% of the population have access to flush toilets while 12.2% of the population depend on pit toilets and 13.7% of them using pit toilets with not ventilation pipes (Stats SA, 2016). Even though flush toilets were common in provinces like Western Cape (93.4%) and Gauteng (86.3%) but they were significantly low in in a province like Limpopo (23.6%) (Stats SA, 2016). When looking at the delivery of electricity, even though 87.6% of households have reported having access to electricity in 2016, access differed across the municipalities. The highest percentage of households who had access to electricity was accounted in the Western Cape with 92.7%, while the lowest came from the Eastern Cape with 84.3% (Stats SA, 2016). Overall from 2002 to 2017 the percentage of households connected to an electricity supply from mains increased from 76.7% to 84.4% in that period (Stats SA, 2017).

The unfortunate part is that the provision and maintenance of these resources has been unreliable. In response to this, communities have been engaging in a number of protests demanding better services. The popularity of the term ‘service delivery protest’ has therefore been loosely used in the media as a definition of different types of protests (Chen et al., 2014). According to Mc Lennan (2015), even though South Africa was already in its second decade of freedom, but in the news, there have been headlines of disapprovals and protests aimed towards poor service delivery in “housing, water, electricity and corruption” (Mc Lennan, 2015, p. 5). The Institute for Security Studies in their Protest and Public Violence Monitor (PPVM) recorded protest actions in South Africa between January 2013 and December 2017; finding that there have been 4 391 protest events combined with violence (Lancaster, 2018). The common theme of local protests has been betrayal; the accusation made is that government promises are not kept (Mc Lennan, 2015). The grievances uttered by the protest movements in the study by von Holdt et al. (2011) centred around problems such as dirty water supply, the insufficiency of recreational facilities and lack of maintaining of those facilities, joblessness, and application of employment nepotism, having no houses, failure of finalising council deals in order to build roads and houses, and overall poor services. As highlighted in Alexander (2010), the protests during former President Thabo Mbeki’s era started to increase by 2005 and quietened the following year as a result of the local government elections. During the election, when the politicians have put their energies into campaigning, is the time when the population still have hope; the following year after the election year in 2007 the protests intensified again. The same situation happened again in 2009 towards the election of former President Jacob Zuma, where there were only five protests before the election then after the election an overwhelming 78 protests were recorded (Alexander, 2010).

In South Africa, the national statistics bureau, Stats SA (2017) states that the provision of sustainable and effective municipal services to the people is the

reason why local governments is in existence. Local government is there to provide services such as water, electricity and many more to the residents provided that the provision is practical and sustainable (Stats SA, 2017). Therefore what will ensure that the provided service is practical and sustainable to get the impactful desired outcomes?

2.8. Towards achieving quality service delivery

Transparency and accountability have always been a fundamental theme in the literature on service delivery (Joshi, 2013). Using the accountability framework of the 2004 World Development Report, Ringold et al. (2011) highlight the three entry points to shaping the quality, effectiveness, and responsiveness of service delivery (Figure 1).

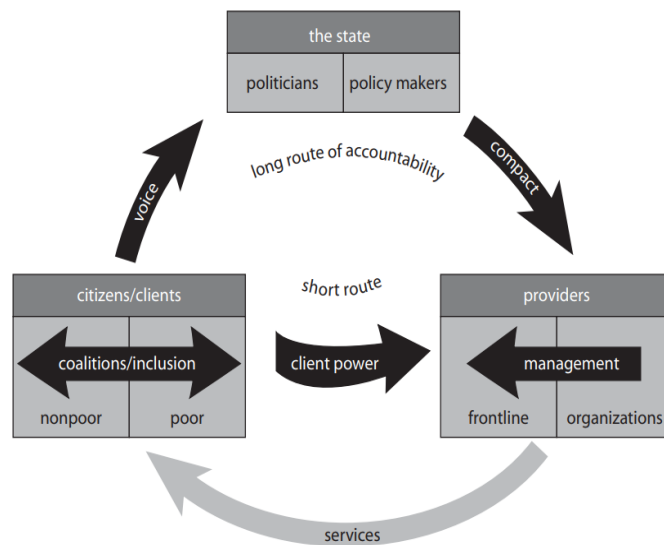


Figure 1: Accountability Relationships in Service Delivery
(Ringold et al., 2011).

In the first entry of the framework shown in Figure 1, the ‘compact’ between politicians and providers depends on many factors such as the quality of

institutions, budget planning, transparency and civil service to name a few. In the second entry, there has to be contact between the citizens and policymakers through networks of voices and expressions (Ringold et al., 2011). These voices can be facilitated by availing information through national-level legal frameworks and micro-level tools such as report cards to the citizens. (Ringold et al., 2011). The availing of information could be by providing information about the performance of the services offered. As a result, the grievance addressed could be feedback to influence policies. In the third entry, citizens have client power as they can have a direct influence on the service providers by claiming some responsibility and participation in ensuring that there is governance to the provided services (Ringold et al., 2011). The involvement of community members is very significant as it will help facilitate services appropriate to the community's needs. Involving the communities will avoid what Alford and O'flynn (2012) call providing of outputs and not delivering desired results.

In other words, the citizens or the users of services can make sure that social services are effective by holding accountable the decisions made by policymakers through 'voice' and by influencing the behaviour of service providers-through 'client power'. It is important that the citizens get access to information about the received services and have opportunities to use the received information to lobby for actions (Ringold et al., 2011). However, participatory or community forums in integrated development planning processes, currently used in South African cities, do not always make participation for all possible or effective (Bénit-Gbaffou, 2008). These integrated participatory forums have shown a level of incapacity to bring their constituencies to the council. Bénit-Gbaffou (2008) argues that in the case of the Soweto Electricity Crisis Committee (SECC); Wafer (2008) has confirmed that the councillors do not have much power when it comes to making decisions at the municipal level. The reason is that the dominant party system expects them to be loyal to their party above everything, even ignoring the views of the residents they are serving. In this regard, South African residents have been shown to have little confidence in reaching out to the local government when compared to the other countries (Bénit-Gbaffou, 2008). One of the reasons for the

lack of confidence could be related to the little importance they attribute to inadequate local councillors. These dysfunctional participatory organisations have driven residents to use other forms of expression generally in their efforts to be listened to such as protests (Bénit-Gbaffou, 2008). Bénit-Gbaffou (2008) highlights that there are other scholars who argue for the importance of the institutional participatory programs in developing a form of responsibility and that residents' groups could be less likely to be manipulated and to a degree can even use the dysfunctional systems for their benefit (Bénit-Gbaffou, 2008). The formality of participatory programs can provide for civil society mobilisation and empowerment (Bénit-Gbaffou, 2008). A participatory action approach can improve the use of resources and improve service delivery (Tetui et al., 2017).

2.9. The duties and obligations of the government and water institutions

North (1990) refers to institutions as guidelines that force or provide opportunities, lessen doubts and therefore govern the incentives of daily life. Institutions are the rules and standards that monitor the behaviour of society (Hearne, 2007). As societies develop and economies become more diverse, with populations increasing as well as earned income, the more water becomes threatened therefore water management also needs to be prepared accordingly (Hearne, 2007). It is, therefore, the obligation of the local government within its capacity to see water service provision is in order (Republic of South Africa, 1996).

In South Africa, local government consists of different kinds of municipalities (metropolitan, local and district) (Pycroft, 2000). Metropolitan municipalities are situated in the eight main cities of South Africa. The areas that are outside of the eight main metropolitan municipal regions are split into local municipalities. A number of local municipalities under a particular area are arranged to form district municipalities (Educational Training Unit, 2010). Category A, also known as a metropolitan municipality, is a local government with elite legislative and administrative authority in its area of jurisdiction. A district municipality

(Category C) is made of municipality executive and legislative authority in an area and consists of more than one municipality. A local municipality (Category B) shares municipal executive and legislative authority with a district municipality (South Africa, 1998).

The Municipal Systems Act of 2000 outlines the fundamental values, background and procedures to allow municipalities to elevate their societies socially and economically, while ensuring affordable universal access to basic services (Algotsson et al., 2009). The latter means that the civil service is required to guarantee a satisfactory and sound quality of life, therefore, ensuring public health or environmental safety. The Local Government: Municipal Structures Act of 1998, also known as the Structures Act, sets the primary formation for local government (DWA, 2005). In the case of water, the Structures Act gives district municipalities the authority to perform water service according to the Water Services Act, but when required, through consultation, the Minister of Provincial and Local Government may allow local municipalities to be Water Service Authorities (WSA) (DWA, 2005). This is as seen in the case of this research where MLM – the local municipality - and not BPD – the district municipality - is the WSA. WSA is a municipality that has the administrative right of water provision within its area of jurisdiction based on the Municipal Structures Act or the ministerial agreements upon the Municipal Structures Act's conditions. This then says that the municipality has the responsibility of guaranteeing provision of water and sanitation services (DWA, 2005). The end product of the water service is provided by the Water Service Provider (WSP), which is a body that is responsible to physically deliver water supply and sanitation services the end users in regard to the contract they have with WSA (DWA, 2005).

However, as National Treasury (2011b) notes,

“Many smaller municipalities do not have the necessary economies of scale, skills and specialisation to provide a water services function efficiently and effectively. The Department of Water Affairs is currently supporting many institutional reform investigations aimed at advising

Water Services Authorities (municipalities) on the most appropriate institutional options applicable for that service provision area” (p.139).

Kanyane (2014) points out that the problems cannot be separated from the related realities of the government roles. After the re-demarcation of municipalities around the 2000 local government elections and the announcement of the reform, some municipal areas are still in a situation where they are not financially and economically stable (Dzengwa, 2007). The shortage of experience of municipal executives and councillors is tied together with the lack of adequate funding, resulting in the unproductive service delivery at a local government level (Laubscher, 2012). Moreover, the lost money and loopholes signal and promote fraud. This elevates the ongoing financial crisis facing the municipalities, which leads to incompetent service delivery (Laubscher, 2012).

Saleth et al. (1999) point out that reforming institutions is an overwhelming challenge for many countries. Institutional proficiency, capability and performance are essential factors for water infrastructure delivery and management in South Africa (Van Koppen and Schreiner, 2014). DWAF has also recognised that the institutional frameworks need reform, where an assigned task can include 184 institutions (Ruiters and Matji, 2015). According to Ruiters and Matji (2015), there has been a lack of systematic analysis when it comes to the nature and extent of the link between strong institutions and improved results.

2.10. The concept of water governance

It is clear that when the quality of governance does have an impact on the level of happiness/satisfaction of its citizens, then it means that the government system is doing well. According to Rogers and Hall (2003), the concept of water governance is associated with a number of political, social, economic and administrative structures that are crucial in the development, management and supply of water in different spheres of society. The idea around the governance of water takes into account the capacity to initiate general public guidelines and institutional frameworks and to mobilise public resources in support of structures

(Rogers and Hall, 2003). Bucknall et al. (2006) echo this view and add that there are many factors that good water governance relies on such as strong policy, approval and supervisory frameworks. Therefore, there has to be a municipal commitment towards improving the management of water and also making applicable investments. The excellent manner of water governance is seen as critical to fixing the past flaws in the supply of water, and can be used as the tool to remove corruption, complacency, lack of accountability amongst others and, most importantly to be used as an instrument to achieve the MDGs (Bucknall et al., 2006). It is vital to have inclusive and transparent practices for budgeting and accounting that will give clarity to water activities and any related problems including infrastructure investment, and also to align different strategic plans to annual financial plans of governments (OECD, 2003). Rogers and Hall (2003) also highlighted the importance of equity amongst the various stakeholders and users, and that this requires constant monitoring through the development and implementation of the policies. Water governance must be established on the grounds of the ethics of the society in which they serve and on the rule of law (Rogers and Hall 2003).

The best case scenario of sustainable cooperative and participatory natural resource management institutions have undoubtedly contributed to the growing urgency for the government to embrace and institutionalise participatory governance of natural resources (Brown, 2011). Neaera and Keck (2009) have highlighted that the application of environmental policy in the case study of Brazil should regularly have activists inside and outside the state operational system across the entire policy process, starting with the lobbying for policy decisions until the implementation stage.

Water governance in regards to South Africa under the 1998 National Water Act is imagined through the founding of 19 decentralised Catchment Management Agencies (CMA) for each selected Water Management Areas (WMA), serving the interests of all water consumers (Claassen, 2013). One of the central values of the

National Water Act is its emphasis on decentralisation encouraging public involvement in water management and associated decision-making practices. Decentralisation rests on the principle that the tasks that can be initiated by lower levels of the state should be passed on to the lowest applicable level. CMAs carry out specified water management duties and therefore are also service delivery agencies. The association of the CMAs to Treasury Regulations is to guarantee financial feasibility and good governance (Meissner et al., 2017). The governance framework works to provide a balance between the state authority in the interests of the country and local participation towards mutual benefit (Claassen, 2013). Governance in this manner was set to result from participatory processes and backed by a locally taxed water resource management to charge all the registered water users (Brown, 2011).

The legal authorising structure that is in place to support Integrated Water Resources Management (IWRM) needs good governance that is backed by management, and institutional capacity to give impact to IWRM (Claassen, 2013). Research has found weak interaction between sectors and policies, and challenges in the engagement of stakeholders regarding decision-making, which delay full implementation (Claassen, 2013). Nonetheless, despite these visible pressures to IWRM, there are encouraging signs that certain portions of the IWRM operates well in the WMA (Funke et al., 2007). A representative from DWAF mentioned that dealing with catchment management in the area has various stakeholders and water users becoming closely involved in establishing a CMA. There has been a good development achieved to extend the participation base to involve the relevant sectors fully (Funke et al., 2007).

2.11. Political ecology as an approach to understanding water injustice in South Africa

The view of political ecology when it comes to studying water advocates for a close link between the changes in and about the hydrological cycle at all levels

(local, regional and global) and understanding the relations of societal, political, commercial, and cultural power (Swyngedouw, 2009). Jackson and Sultana (2016, p.7) suggest that the 'hydrosocial cycle' could be a better model when it comes to the geoengineering concept of the 'hydrological cycle', recognizing that the development of water supply is entrenched in a number of issues such as "climate change, food security, natural disasters, healthy ecosystems, and livelihood well-being". In Forsyth (2004) 'political ecology' is understood to combine the ecological concerns with political economy. This then incorporates the continuously ever-changing conflict between society and land-based resources, and conflict in a society within different classes and groups.

For political ecologists, scarcity of natural resources is seldom natural: understanding its construction is important (Robbins, 2012). Popular accounts blame nature and population for insufficiency of resources. For political ecologists, these are rather issues of distribution and power over that. Moreover, political and economic structures and restructuring have made the ecological system more vulnerable to degradation, rather than population or 'natural' processes (Robbins, 2012).

This is because, as Sundberg and Dempsey (2013) remind us, all socio-political projects are related to the ecological and the ecological is interrelated to politics. The world around us is already politicised, and for that reason, it is hard to comprehend ecologies outside the consideration of politics (Sundberg and Dempsey, 2013); power relations inform socio-ecological actions, and often produce unequal distribution (Sundberg and Dempsey, 2013). Often deeply involved in this state of affairs are authorities and elites whose activities concentrate on the extraction of wealth from the rural to benefit the urban upper class (Nepal and Saarinen 2016). For some, the government must be looked at as a set of multifaceted structures and strategies that mirror the strength of political rule and social contestations (Mullenite, 2015).

“Structures” can be understood as “the confluence of institutional rules and interactive routines, mobilization of resources, as well as physical structures such as buildings and roads (Lu, 2011, p. 267).” Structures provide “background conditions for individual actions by presenting actors with options; they provide ‘channels’ that both enable action and constrain” agency. The concept of structural injustice *then* refers to social structures and processes—embodied in “institutions, discourses, and practices”—that are based on morally unacceptable values or belief systems” (Lu, 2011, p. 267).

Wright-Contreras (2019) argues that looking at infrastructural systems, such as water, through the eyes of urban political ecology allows us to examine the power relations involved. For a long time, historians of technology have spoken about how infrastructures have been utilised to shape and withstand political administrations, whether as mechanisms of defensive assimilation for states or of municipal elevation (Obertreis et al., 2016). The supply of water, just like other infrastructural systems, rests on a network of interconnected actors with political interests to uphold and invest in the structures that support them (Wright-Contreras, 2019).

In the case of South Africa, Smith (2002) uses a political ecology approach to analyse the Cape Town context of water provision, stressing that to move past the social injustice that produces water’s unequal distribution, there has to be an interrogation of the wider social structures and institutional settings. Muller (2009) also adds that with poverty and inequality continuing to outline the experience of most of the South Africans, it is a concern that most of the opportunities provided by the water sector for growth and social change have not been used efficiently.

Taking inspiration from this work, this research project aims to examine and understand the unequal distribution of resources as described in political ecology

through water access. Using rural and peri-urban areas in the Moretele region as case studies, the research tries to understand how water provision/access occurs and what the dynamics that determine it are.

2.12. Conclusion

Chapter two of the study looked at relevant literature related to water access and supply on the international and local stage. Political ecology as a framework helped to analyse how resources such as water are contested by structures of politics, economy and society. On the broader scale, the chapter started holistically by giving the availability and challenges of water internationally. This was followed by assessing the past and present water situation in South Africa; this was to understand how the policies of water have changed and shaped the water landscape in South Africa over the years. What resulted was an analysis of the progression from the apartheid era into the democratic government assessing the early constraints which were experienced. With the constraints which were faced by the government in the 1990s, the policy of FBW became the cornerstone policy of the early 2000s. The introduction of FBW had a huge significance in highlighting and addressing the point that water is needed to alleviate poverty. Relating to FBW, the literature brought to the fore the arguments on privatisation and anti-privatisation of water.

Statistics show that service delivery has made some strides, although there is significant work that needs to be done for people to have adequate water. When government delivery has failed to reach the expectations of the public, the indication has been that people turn to protests to voice their concerns. But in regards to this Ringold et al. (2011) have argued that to hold each other accountable there is a need for engagement from the different stakeholders to ensure that service delivery is achieved. This is on the basis of delivering desired results and not just on the provision of outputs (Alford and O'flynn 2012).

The literature takes us on the journey through the South African policies on how government should not run away from the responsibility of doing anything within its power to see that there is proper management of water and that people get access to this water. It is however not always the case, in some cases municipalities do not have the required skills and capacity to see that the water provision functions efficiently. Ruiters and Matji (2015) note that there is a lack of systematic analysis in the connection between strong institutions and improved results. Ruiters and Matji (2015) have therefore highlighted that DWAF had recognised the need to reform their institutional framework which included assessment of WSA, WSP and user associations. It was here that the literature (Bucknall et al. 2006; Bakker et al. 2008; Rogers and Hall, 2003) shared the importance of water governance, as a reforming tool that could be used to fix past flaws of corruption and lack of accountability in achieving the MDGs.

Chapter 3: Methodology

3.1. Introduction

The chapter will start by setting the scene of where the study takes place. It will also provide the significance of the project being conducted in the Moretele region. The chapter introduces the three village case studies regarding where they are situated, places around them and the type of settlements they are. It works to convey a sense of place through observational vignettes, photographs and sketches of these three villages, as collected during my fieldwork and shaped by my own experience. This chapter presents the reasons why specific methodologies were used to collect data for a qualitative and multi-site research design. After that, there will be elaborations of the sampling methods and the manner in which data was collected giving the justification for the tools used. Following that, the chapter will then explain how the received data was turned into meaningful data through data analysis. The chapter will round up with discussions of ethical considerations and limitations.

3.2. Positionality

As mentioned before the project is a continuation of the honours project which I did focusing primarily on the village of Makapanstad. As I grew up in the rural village of Makapanstad, water access has always been an issue that never seemed to get better. In the 1990s, the dominant mode of water access was through boreholes, then later in the 1990s treated water was introduced in the form of standpipes. Ever since, water access did not seem to improve, with people self-connecting standpipes into their homes followed by access being stopped by the local municipality. The recent phenomenon has been that of water being supplied by trucks to the community; reticulated water to the households is limited. The truck water supply has not accommodated everyone in the community.

My honours project presented different manners in which the people of Makapanstad access water and how they were affected by this. Transferring this into my master's project, I wanted to find out about the wider dynamics shaping water access. This led to the integration of the involved institutions (WSA and WSP). The involvement of MLM as a WSA provided compelling information for the expansion of the project to include other villages in the region who presented other experiences of water access in the region.

3.3. Study Sites

The study was conducted in the Moretele region in the North West Province of South Africa. The research covered the three villages in the area (Makapanstad, Carousel View and Ngobi). The three villages were chosen as they demonstrate different water circumstances and key trends of how water access occurs in and around the Moretele region (while not necessarily generalizable to the whole province). The villages also offer different types of settlements found in the region (rural and peri-urban), with distinctive distances from the WSA and WSPs. Relative to how the three selected villages are served with water; MLM is the WSA, and the CoT is the WSP which justifies their inclusion in the study.

3.3.1. The context of the Moretele region

Moretele region officially known as MLM is one of the five local municipalities in the BPD in the North West (as shown in the map in Figure 2). The local municipality is situated in the northeast of the North West province and just northwest of Pretoria. The location of the municipality's headquarters is in the village of Mathibestad, which neighbours the Makapanstad village (Figure 3). Using the Makapanstad road heading south in the direction of Hammanskraal, one turns right at the Itatswe spaza shop then follows the tar road to reach the offices of the municipality.

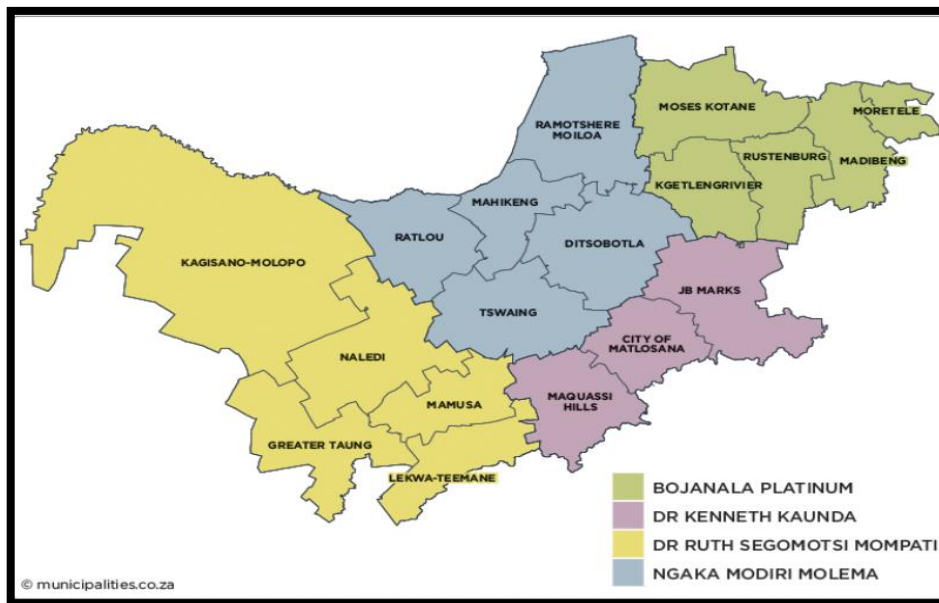


Figure 2: Map of the municipalities in the North West province with Moretele Local Municipality in the top right corner

(Municipalities. n.d)

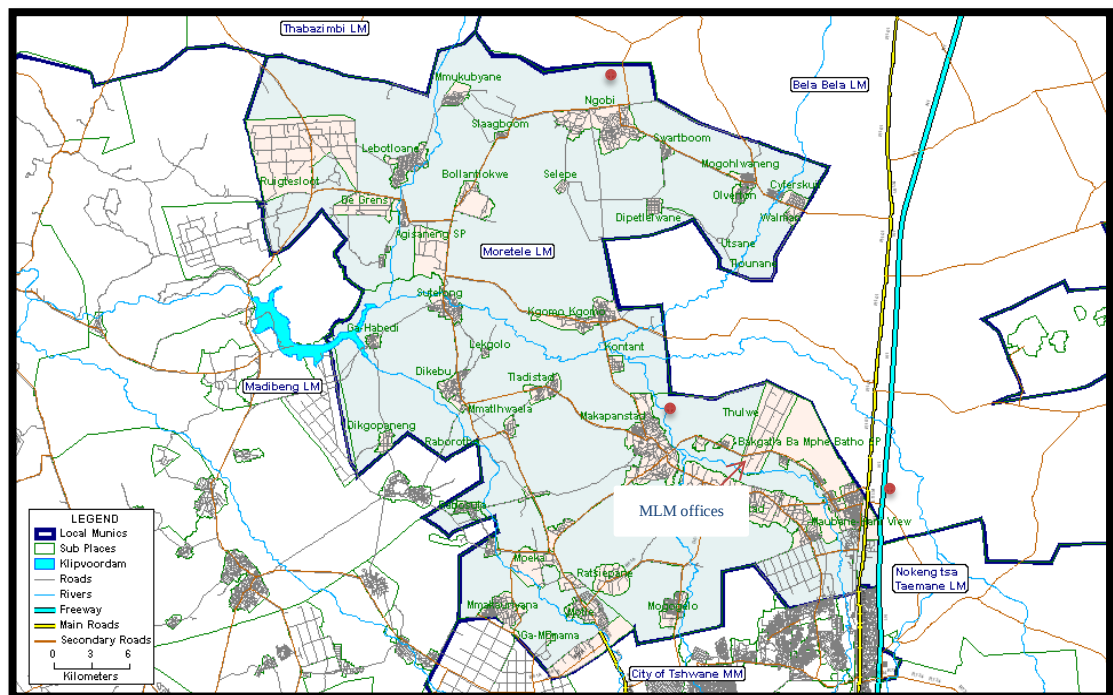


Figure 3: Map of the Moretele region showing some of its surroundings and research sites pointed in red dots (Makapanstad, Carousel View and Ngobi villages)

(Magalies Water, 2013).

The MLM was created in the year 2000, and it is positioned between four provinces; Limpopo, Mpumalanga, Gauteng and North West. Moretele region is home to 186 947 individuals occupying an area of 1369 km² with a population density of 136.56 people per square kilometre. The municipality is named after the Moretele River, or noka ya Moretele as referred in Tswana, which runs through the area. In the Moretele region, there are 66 villages and plots grouped into 24 wards. Four traditional leaders approved by the law, rule the majority of the villages, and serve their respective communities in the council body (Moretele Local Municipality, n.d).

Table 1: Demographic statistics of the three villages together with MLM as a whole (Stats SA, n.d).

Locations	Areas of the locations	Population	Number of households	Population density (Population Density = Total population/Land Area)	Average household size	Households with piped water inside dwelling	Households with flush toilet connected to sewerage
Makapanstad village	20.45 (km ²)	15 076	4 316	737.21/ km ²	3.5	4.7%	1.7%
Carousel View village	1.68 (km ²)	6 973	2 233	4150.60/km ²	3.1	4.1%	0.9%
Ngobi village	15.46 (km ²)	3 494	1 041	226.00/km ²	3.3	3.8%	0.6%
Moretele Local Municipality	1 369 (km ²)	186 947	52 063	136.56/ km ²	3.6	8.7%	4.4%

3.3.2. The context of Makapanstad

Makapanstad is a rural type of settlement. Based on the 2011 census, this village covers an area of 20.45 km² and has a population of 15 076 people. Therefore as seen in table 1, Makapanstad has a population density of 737.21 people per square kilometre. On average there are 4 316 households, and the average household size is 3.5 people per household (Stats SA, n.d). The percentage of homes with piped water is 4.7% while the percentage of households with flush toilets connected to

sewerage is 1.7%. The average household monthly income for 26.4% of the population is between R9 601 - R19 600. 21.1% reported an average household income of between R19 601 - R38 200 (Stats SA, n.d). However, 25.7% have an average household income of less than R9 600, with up to 16.7% reporting no income at all. South African black people mostly populate the village, but during the last few years, Makapanstad has seen growth in the number of foreign nationals mainly there to make a living. This is through reviving the spaza shops previously owned by the locals and doing domestic jobs such as gardening.

Makapanstad is a village generally centrally positioned in the Moretele region, somewhat towards the east of the region. It is surrounded by a number of villages as seen in Figure 3; in the south, it is enclosed by the village of Mathibestad on both sides of the Makapanstad Road. There are a few kilometres of forest from the west end of Makapanstad until the village of Swartdam which is 13.2 km away. On the south-east end of the village just after crossing the Tshwane River are found the villages of Potoane and Prieska respectively. As the Apies River flows northward coming from Tshwane reaches the Moretele region and streams become thinner between the villages of Danhouse and Carousel View, the river is referred to as the Tshwane River heading northwards. The Tshwane River passes through the eastern part of the Makapanstad coming from the south. The river passes through the north-eastern part of the village which is dominated by cultivated land, and this is where some villagers keep their cattle to graze and occupy the space (Figure 8). As the Makapanstad road heads north of the village, it splits into two routes that go east and west (Figure 6). On the northeast of the village, there is a thick forest before reaching the village of Kontant (7 km away). To the northwest of Makapanstad is the village of Tladistad which is 10 km away.

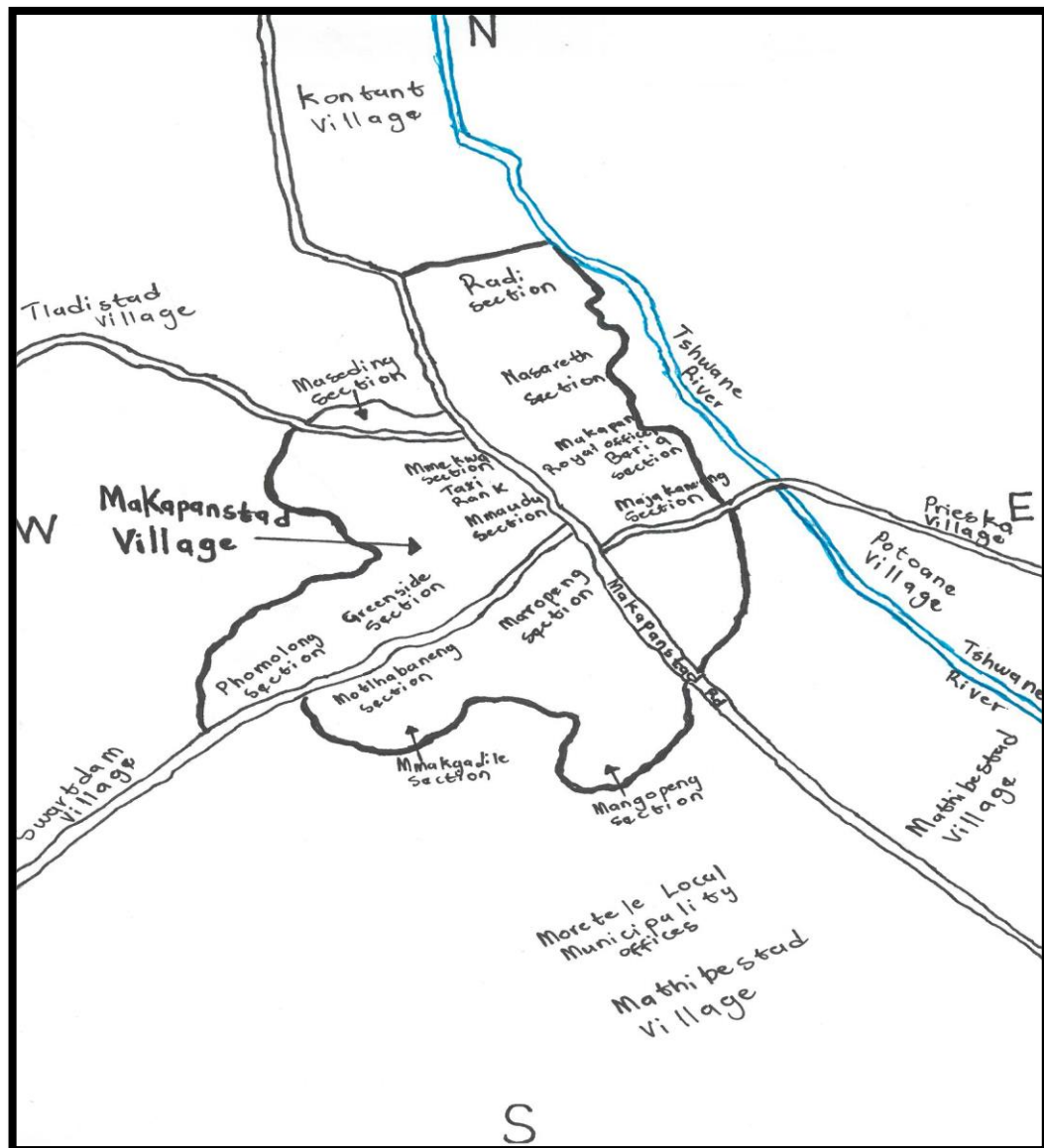


Figure 4: Rough composition sketch of Makapanstad

Sketch: Motshwaedi Sepeng (researcher)



Figure 5: Makapanstad T-junction; separating the north, south and the west of the village

Photo: Motshwaedi Sepeng (researcher)



Figure 6: Road from heading into the western end of the village

Photo: Motshwaedi Sepeng (researcher)



Figure 7: Potoane Road heading to the eastern end of the village

Photo: Motshwaedi Sepeng (researcher)



Figure 8: Tshwane River in the north part of Makapanstad village

Photo: Motshwaedi Sepeng (researcher)

Three main roads divide the Makapanstad village into east and west. The first and the main road is the 'Makapanstad Road', which runs through the village from the south of the village (Hammanskraal direction) heading into the north of the Makapanstad village and eventually into some of the northern villages in the Moretele region. The small town of Hammanskraal is about 30 km away from Makapanstad (Figure 9). The second road on the west side of the village cuts the Makapanstad road in half, forming a T-junction (Figure 5) close to the Mmammundu Primary School. From the T-junction, the route heads into the western part of the village (Figure 6). This road separates the whole of the west of the village into north and south. By the Mmammundu Primary School when crossing the Makapanstad road to go to the east of the village, one finds the third and last road which separates the eastern side of the village into north and south. The previously gravelled road informally known as the 'Potoane Road', (Figure 7) heads straight towards the end of the village on the south-east before reaching the Tshwane River. Just after the Tshwane River, there are a few kilometres of the forest before reaching the village of Potoane.

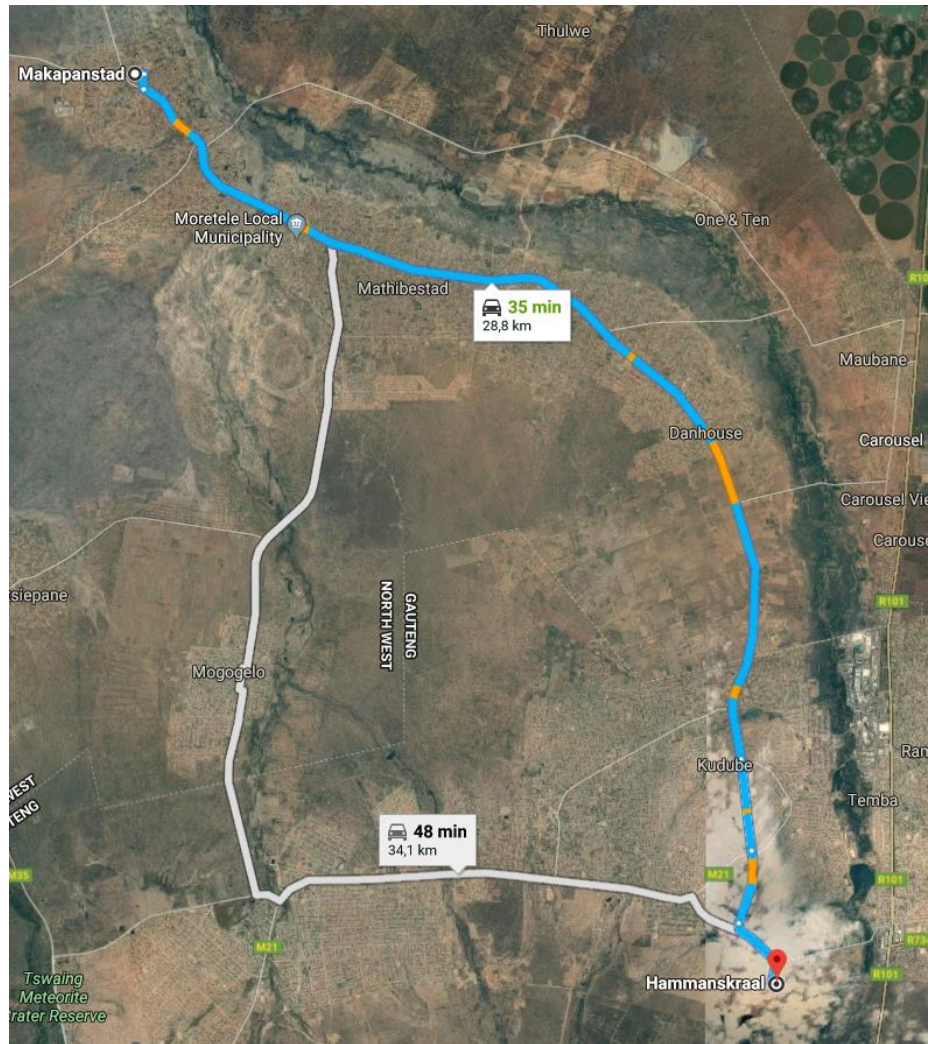


Figure 9: Map of Makapanstad village in relation to its neighbouring settlements
(Google Maps, n.d)

3.3.2.1. Sections in Makapanstad

The village is divided into a number of small sections across the 20.45 km² area. For this research, I went to as many sections in Makapanstad as possible to make sure that I equally covered all the corners of the village, but not necessarily all the sections as my previous research identified which shared similar water access characteristics (Figure 4). I first went to the west of the village, where data collection was done in the Motlhabaneng section, then Makgadile section just south of the western part of the village. Motlhabaneng is the section where the Makapanstad reservoirs are situated. Later, I went to Phomolong and Greenside

sections just across the road (still on the west part of Makapanstad). In this western part of the village is where most of the households reported that the government treated water is not reaching them.

I later visited the Beria section in the north of the village, where the village's taxi rank is situated. I then approached the Nazareth section across the Makapanstad road on the northeast of the village, where the Makapan royal offices are located. Still on the east of the village now heading south, I went to the Phake section.

The next time I went to the field, I went back to the west of the village. There I visited the Mangopeng section southwest of Makapanstad at the end of the village before crossing into the Mathibestad village before I ended the data collection by going to the Maropeng section.

3.3.3. The context of Carousel View



Figure 10: Map of Carousel View in relation to its neighbouring settlements
(Google Maps, n.d)

Carousel View is a village situated in the south-east of the Moretele region along the R101 road (Figure 10). The village is about 13 km away from the town of Hammanskraal. This village of 6 973 individuals is a peri-urban type of settlement that covers an area of 1.68 km² giving it a population density of 4150.60 people per square kilometre. The average household monthly income for 24.8% of the population is between R19 601 - R38 200. 19% reported an average household income of between R9 601 - R19 600 (Stats SA, n.d). However, 36% of the population have an average household income of less than R9 600, with up to 18.8% reporting no income at all.

Carousel View is made up of RDP houses; it also has a township-like setup with grid street patterns, as shown in Figure 11. RDP houses in South Africa are houses constructed and funded by the government for households earning less than R3 500 per month (National Treasury, 2009). Approximately 25% of Carousel View's population would fall within this category (Stats SA, n.d.). Even though the neo-liberal framework of GEAR quickly replaced the RDP framework, the houses have since been referred to as 'RDP houses'. The house is basically what will be termed a three-roomed house with mainly small bedrooms, a sitting area and kitchen.



Figure 11: (A) Carousel View's RDP Houses with pit toilets on the side in. (B) One of the streets in Carousel View.

Photo: Motshwaedi Sepeng (researcher)

3.3.3.1. Sections in Carousel View

There are three main sections in Carousel View: A, B and C as illustrated in Figure 12. When I went to Carousel View, my first visit was to the middle section also known as section C which is opposite the Carousel Hotel. I first walked around a couple of streets in this section to familiarise myself with the setting of the village. Then I went into a number of participants' houses to do interviews. Some of the participants mentioned the standpipes in front of the Carousel Hotel. I crossed the very busy R101 road to visit this water setup in front of the Carousel Hotel.

The next visit to Carousel View was in the south of the village in section B, because of their proximity to the Babelegi Industrial Park. The Apies River that runs past the Leeukraal Dam also run passes the Babelegi Industrial Park along the railway line (Figure 12). I first went to the houses at the end of section B to find out if the participants there receive better water supply because of being close to the firms. The participants from this section also told me that they collect water from the village of Ramotse on the other side the R101 road. I, followed up with a minor observation in Ramotse.

My last visit to Carousel View was on the 10th of January 2018 to section A in the north of the village; it is closer to the village of Maubane on the north-west. Also on the west is Bosplaas, a village 10 minutes away separated by a railway line.

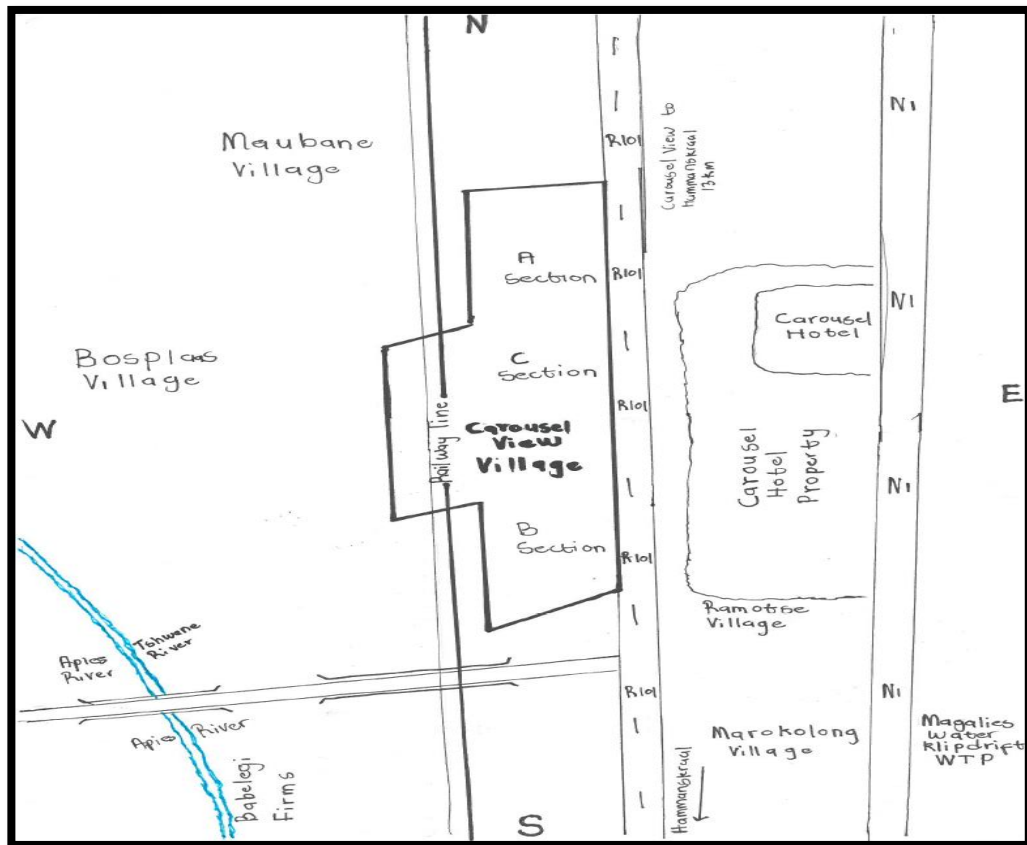


Figure 12: Rough composition sketch of Carousel View

Sketch: Motshwaedi Sepeng (researcher)

3.3.3.2. Babelegi Industrial Park

Babelegi Industrial Park is key to understanding Carousel View. Babelegi Industrial Park is an industrial piece of land, which came about as the plan of the apartheid government of decentralising industries from major metropolitan areas in white areas to control black urbanisation. In the 1960s there were negotiations that happened between Dr Koornhof, a National Party cabinet minister, at that time of Bantu Affairs and Bantu Education, and the tribal leaders in the Kekana to claim approximately 138 ha of land that was used for grazing, to be developed for factories (Van Huyssteen, 2001). The government then listed Portion 9 of the Farm, Leeukraal 92-JR under South Africa. The Babelegi Industrial Park was then developed based on the agreement between the Tribal Authority which resulted in the tribes receiving R100 764 by October 22nd 1980 (Van Huyssteen, 2001).

Babelegi Industrial Park was looked at as a growth point. According to Bell (1973), the apartheid government identified growth points near the the so-called 'homelands'. The first reason for the establishment of these growth points was to offer people in and around the 'homelands' job opportunities in manufacturing (Bell, 1973); the second reason was to use 'growth points' as a political tool to dispirit the people from leaving their so-called 'homelands' (Geyer, 1989) and shore up grand apartheid. In his 1977 speech, the Bophuthatswana Chief Minister, Chief Mangope, celebrated that in 1970 Babelegi Industrial Park was just a piece of grazing land and seven years later, there were 80 operational factories plus 20 more still under consideration. Over the years there has been a decline in production in the Babelegi Industrial Park. The funded firms were the life force of the local economy but when government support for these border industries was halted in the 1990s, many of the firms collapsed (Makanya, 2018).

3.3.4. The context of Ngobi village



Figure 13: Map of Ngobi village in relation to neighbouring settlements

(Google Maps, n.d)

Ngobi is one of the northern-most villages situated in the northeast of the Moretele region before bridging into the Limpopo province leaving the North West province (Figure 13). According to the 2011 census, this rural settlement covers 15.46 km² and has a population of about 3 494 individuals (Stats SA, n.d). Table 1 shows that the population density of Ngobi is the lowest of the three villages with 226 people per square kilometre. The majority of the population,

32.9%, have an average household income ranging between R9 601 - R19 600. The second largest share of the population (21.2%) has no income (Stats SA, n.d), which constitutes a large part of the 33.3% who have less than R9 600/month.

The place has homes with big yards, with some portion of the yards used for farming and keeping livestock. On entering the village of Ngobi, one immediately notices the beach-like sandy loam soil (Figure 14). The settlement is surrounded by a forest of trees that is synonymous with the villages in the north of Moretele. In between Ngobi and its nearest neighbours, there are great tracts of forest trees. On the south of Ngobi, the next village is Dipetlelwane, and on the south-east, the village of Swartboom (Figure 13). Selepe is a village on the south-west of Ngobi village. Transactie is the closest village to Ngobi on the west separated by a gravel road. Just north of Ngobi, there are about 5 km of dense forest grounds until the Limpopo border.

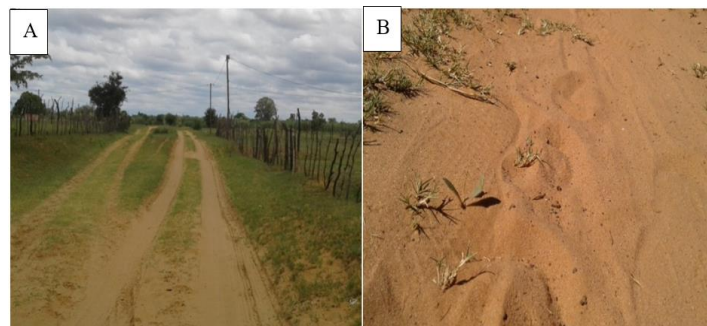


Figure 14: (A) A Street in Ngobi village and (B) photo showing the beach-like sandy loam soil from Ngobi village

Photo Motshwaedi Sepeng (researcher)

From Hammanskraal to Ngobi through the use of public transport, one needs to catch a taxi from the Hammanskraal station and take a one-hour trip which is over 60 km to get to Ngobi. The taxi goes along the R101 road until turning left at a three-way stop, leaving the R101 highway that spans into Limpopo province from the North West province (Figure 13). From there, heading in a north-westerly

direction, one will have to pass villages such as Olverton and Swartboom before reaching the Ngobi village. Some residents there prefer to go to Bela-Bela (in Limpopo) for shopping which is a 34 km drive rather than going to Hammanskraal 60 km away.

3.3.4.1. Sections in Ngobi

During my data collection in Ngobi, I went to three sections: Matlala Rrakgotho, Max and Black Rock section which is the last section before getting into the Transactie reservoirs (water plant) (Figure 15). Matlala Rrakgotho section is divided by a road that leads to a T-junction before reaching the forest at the end of the village in the north. Across the main road, south of the Matlala Rrakgotho sections you then get into the Max section. The last section that I visited on the north-western of the village was Black Rock section; this is the section that is close to the gravel road before reaching the village of Transactie and ultimately the Transactie reservoirs plant.

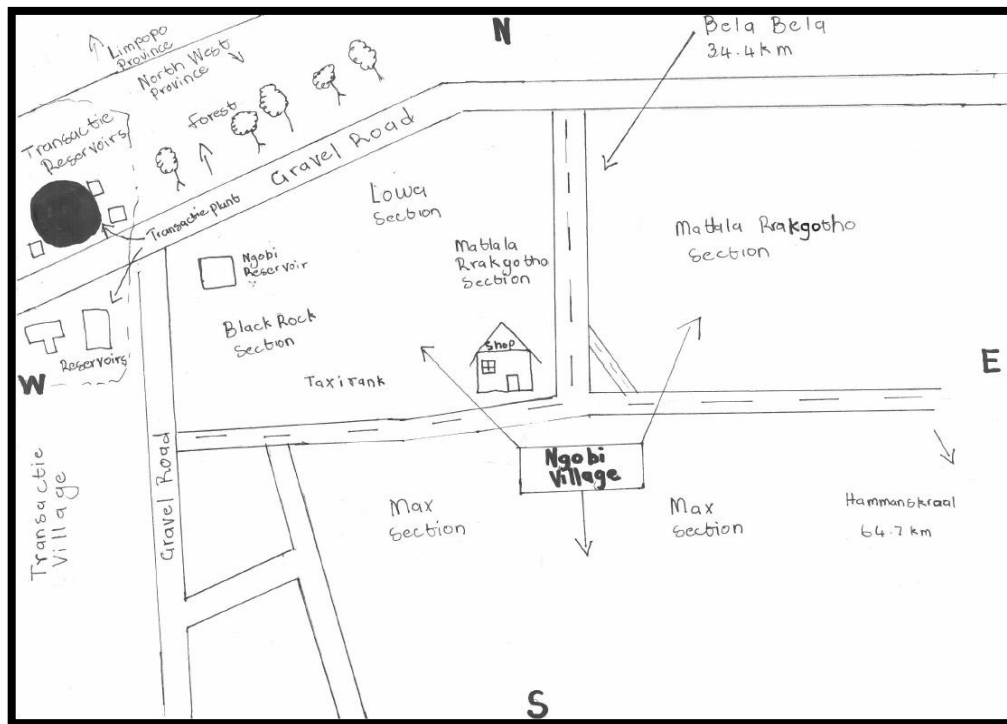


Figure 15: Rough composition sketch of Ngobi

Sketch: Motshwaedi Sepeng (researcher)

3.4. Methodology

3.4.1. Qualitative approach

According to Flick (1998, 13), “qualitative research is oriented towards analysing concrete cases in their temporal and local particularity and starting from people’s expressions and activities in their local contexts”. In other words, qualitative research looks at objects in their natural backgrounds with the attempt to understand or to understand occurrences as a result of the meanings people bring to them (Shkedi, 2005). There are many suitable techniques such as observation, in-depth individual interviews, nominal group process, the Delphi techniques, focus-group interviews and others (Monsen and Van Horn, 2007). This study made use of individual interviews, observations and document review. Triangulating across these methods was key, to realise “the principle that we learn more by observing from multiple perspectives than by looking from only a single perspective” (Neuman, 2014, p.166).

3.4.2. Multi-site case study research

Initially, the village of Makapanstad was the only case study that was going to be used for this research, but through understanding that water access is a broader challenge in Moretele as a whole then the study changed to involve other villages additionally. A multi-site case study provides a way of understanding an individual incident, policy, programme, or group using multiple representations of that incident (Mills et al., 2009). In other words, by demonstrating the understandings, associations, or effects of the incident through more than one setting, broader understandings emerge. “Typically the research design in a multi-site case study is the same across all sites. This means the same units of analysis or phenomenon is studied in light of the same or research questions” (Mills et al., 2009, p.587). Therefore, in this research, certain aspects of the design remain constant, i.e. the sample size and research questions for the villages, although each case has its own distinct characteristics.

3.5. Sampling methods

3.5.1. Non-probability sampling

In the process of identifying the participants during data collection, the study used non-probability sampling methods for all three stakeholder groups (the three villages, the WSA and the WSP). Non-probability sampling is a sampling technique that does not aim to generate a representative sample (Neuman, 2014). The selected method was not random selection of the participants in the populations. The aim was to choose individuals in the population who fit the chosen criteria highlighted through purposive sampling, as described below.

3.5.2. Sampling the three case villages in the Moretele region

As mentioned before, MLM officials told me that they supply water to the people in the region mainly through three different methods. Therefore, I purposefully selected case villages that experience the three water access methods. Namely, I

wanted to examine a village that receives water from the municipality through household reticulation or standpipes and tanker service also known as water trucking; a village that receives water mainly from household reticulation and lastly a village that gets water from the municipality through the groundwater system. In practice, each village experienced a mix of the three, with certain modes predominant. The three selected villages are spread across the region to make sure that there is a broad analysis of how water access occurs in the region.

3.5.3. Sampling methods within the villages (Makapanstad, Carousel View and Ngobi)

Purposive sampling was used in the selection of the participants from the three villages. The study completed interviews with 15 participants from each of the three villages, to reach a total number of 45 village participants. Tongco (2007) states that in purposive sampling, the researcher decides the purpose they want the informants to serve in the research, and they go approach appropriate respondents to fulfil that plan. In this case, by virtue of knowledge or experience, the researcher then chooses the informants based on the qualities they possess (Tongco, 2007). I wanted to holistically understand the different kinds of water access in the region of Moretele while also making sure that the data collection included as many corners of the villages as possible. When approaching the participants during the data collection, I purposefully approached a mixture of participants whose dependence on water was either through buying borehole water or owning a borehole or having household municipal water or through any other modes. In this case even though I went to as many sections in the three villages covered in the study as possible, I targeted the sections with different water access characteristics than other sections in the villages. I also wanted a balanced and diverse study with regards to age and gender, therefore during the data collection I kept that in mind (see Table 2). This is to make sure that the data revealed the variety of experiences resulting from the different modes of water access.

Table 2: Interview demographics and details from case villages

Makapanstad village						Carousel View village					
Participant	Gender	Age group 18-26 27-39 40+	Race	Sections	Days	Participant	Gender	Age group 18-26 27-39 40+	Race	Sections	Days
1	Female	40+	Black	Motlhabaneng	6/10/17	1	Female	27-39	Black	C	22/12/17
2	Female	40+	Black	Motlhabaneng	6/10/17	2	Female	27-39	Black	C	22/12/17
3	Male	18-26	Black	Mmakgadile	6/10/17	3	Male	40+	Black	C	22/12/17
4	Female	18-26	Black	Phomolong	6/10/17	4	Male	27-39	Black	C	22/12/17
5	Female	27-39	Black	Greenside	6/10/17	5	Male	40+	Black	C	22/12/17
6	Female	40+	Black	Greenside	6/10/17	6	Female	40+	Black	B	03/01/18
7	Male	27-39	Black	Beria	9/10/17	7	Female	27-39	Black	B	03/01/18
8	Male	40+	Black	Mmaudu	9/10/17	8	Male	18-26	Black	B	03/01/18
9	Female	40+	Black	Mmaudu	9/10/17	9	Male	27-39	Black	B	03/01/18
10	Male	18-26	Black	Nazareth	17/10/17	10	Male	18-26	Black	B	03/01/18
11	Female	40+	Black	Nazareth	17/10/17	11	Female	18-26	Black	A	10/01/18
12	Male	27-39	Black	Phake	17/10/17	12	Female	27-39	Black	A	10/01/18
13	Male	18-26	Black	Maropeng	23/10/17	13	Female	40+	Black	A	10/01/18
14	Female	40+	Black	Mangopeng	23/10/17	14	Male	27-39	Black	A	10/01/18
15	Male	40+	Black	Maropeng	23/10/17	15	Female	40+	Black	A	10/01/18

Ngobi village					
Participant	Gender	Age group 18-26 27-39 40+	Race	Sections	Days
1	Male	18-26	Black	Matlala Rrakgotho	22/12/17
2	Female	18-26	Black	Matlala Rrakgotho	22/12/17
3	Female	40+	Black	Matlala Rrakgotho	22/12/17
4	Male	40+	Black	Matlala Rrakgotho	2/01/18
5	Female	27-39	Black	Matlala Rrakgotho	2/01/18
6	Female	27-39	Black	Max	2/01/18
7	Male	27-39	Black	Max	2/01/18
8	Male	40+	Black	Max	2/01/18
9	Female	27-39	Black	Max	10/01/ 18
10	Male	27-39	Black	Black rock	10/01/ 18
11	Male	40+	Black	Black rock	10/01/ 18
12	Female	18-26	Black	Black rock	10/01/ 18
13	Female	40+	Black	Black rock	10/01/ 18
14	Male	40+	Black	Black rock	10/01/ 18
15	Male	40+	Black	Black rock	10/01/ 18

3.5.4. Sampling methods for the MLM (WSA) and the CoT (WSP)

For the local municipality, purposive and snowball sampling methods were used to identify potential participants. As explained in Babbie (2013), snowball sampling is a nonprobability sampling method where those interviewed may be asked to recommend additional individuals for the researcher to interview. In this regard, after purposively approaching the officials in specific positions at the local municipality, they pointed me to CoT as their WSP. In approaching MLM and CoT respectively, I depended on the individuals within the organisations to direct me to the appropriate people to talk to get the required data.

Table 3: Interview details from institutions

Institutions				
Name of institution	Participant number	Location of the interview	Days	Time of the day
MLM	1	MLM office	25/10/17	9:00am
CoT	1	Capitol Towers North (CoT)	27/11/17	10:54am
	2	Capitol Towers North (CoT)	13/02/18	11:07am
TWPP	1	TWPP	18/04/18	11:16am
	2	TWPP	18/04/18	12:58pm
	2	TWPP	04/05/18	1:01pm

At MLM I interviewed a water technician in charge of overseeing supply and technical aspects of the water infrastructure; and conducted a site visit with an artisan to Ngobi to see the Transactie Reservoir Plant. In the CoT, I interviewed two engineers, one in charge of water and sanitation planning, and the other dealing with the water services in region 2 (Region 2 of the CoT includes places like Hammanskraal which is where the water treatment plant (TWPP) is situated).

At the water treatment plant (TWPP) which supplies water to some parts of Moretele, I interviewed a chemical engineer on the day-to-day functions of the plant and another engineer dealing with the technical functions of the supplied water from the plant into the different regions in the Moretele. Unfortunately, I was not able to interview anyone from the new WSP for MLM, Magalies Water (MW) (see Limitations section).

3.6. Data collection

3.6.1. Structured interviews for the villages

Structured interviews were used to collect the data from the three villages in the Moretele region. The aim was to make sure that the questions are fully understood, and we did not lose track of time during the interview. Structured interviews use prearranged and standardised sets of questions which are asked in the same manner and order (Longhurst, 2003). Based on the experience of my honours research I noticed that it was easy for the interview to drift away from the topic of focus when using semi-structured interviews with people from the villages because of the passion people have on the subject matter. However, my structured set of questions (see Appendix 8.1 for questionnaire), with their mix of closed- and predominantly open-questions, allowed participants the freedom to further elaborate various points.

As a result of the Moretele region being a Setswana area, many of the interviews were conducted in Setswana but this did not change what the questions intended to ask. The interviews with the village participants were conducted during the day from around 12 pm to 5 pm. Table 2 gives a more explicit elaboration of the days, genders, race, and age groups covered during the data collection. The interviews did not take in excess of 30 minutes unless in a situation where the participants further elaborated. The responses were written down on a notepad during the interview. I noticed in my honours project in the Makapanstad village that participants were very sceptical about being recorded during the interview and this wasted time before the interview could resume. For this research project, I, therefore, decided to interview the village participants without using the option of an audio recording and this turned out to work better as it lessened the scepticism from people.

3.6.2. Semi-structured interviews for the institutions

Semi-structured interviews were applied in the collection of data from both the related institutions in the study MLM (one participant) and CoT (four participants). A semi-structured interview is a verbal exchange between the interviewer and the participants whereby the interviewer obtains information from participants by means of asking relatively few, open-ended questions. Even though the interviewer sets out prearranged questions, semi-structured interviews develop in a more conversational style where participants are given the chance to talk about issues they think are important (Longhurst, 2003). The thought was that because I do not have a fair knowledge about their roles, it would be wiser to allow participants from the institutions to explain roles openly, hence semi-structured interviews as compared to structured interviews. As is the nature of semi-structured interviews, a few questions were prepared before the interviews just for guiding the conversation and make sure that the research does not drift away from answering the research question (see Appendix 8.1 for interview guide). The interviews were scheduled to take about 30-45 minutes, but in some cases, it was more than that.

The first institution that I went to for an interview was with the MLM as the WSA in their Mathibestad offices on the 25th of October 2017. The interview was scheduled at 9:00 am, and I was not allowed to use an audio recording for this interview; notes were kept on a notepad. The interviews with the institutions were conducted in a combination of English and Pedi and Setswana depending on what the participants preferred, but this did not change the context what was asked from the prepared questions. In approaching the WSP, the first semi-structured interview took place at the CoT municipality offices in Capitol Towers North, Tshwane on the 27th of November 2017 at 10:54 am. The second interview with CoT took place at the same venue (Capitol Towers North) on 13th of February 2018 at 11:07 am. On both occasions, the interviews with CoT municipality audio recording were permitted; the answers were also written down on a notepad.. After meeting officials from CoT, I had additional interviews at the TWPP to

fulfil the other questions about the duty of CoT in providing water. At the TWPP in Temba, I was not allowed to audio record. The first interview took place on the 18th of April 2018 at 11:16 am. The first visit of the second interview was on the 18th of April 2018 at 12:58 pm; the second visit happened on the 4th of May at 1:01 pm.

3.6.3. Observation

Observation was also used as a data collection tool in this research. Observation is defined as a firm, regular and selective way of observing and listening to interaction or phenomenon taking place (Arora, 2011). Observation can also provide accurate information that cannot be extracted from the interview (Arora, 2011). In other words, an observation was used to give complementary, or triangulating, information to the interviews. For example, it was essential to observe and see what the state of water supply and access was in the community. This was to see if there was a correlation between what people were saying and what happens in the community. This was also to strengthen the validity of the collected data during the analysing of the collected data. Both participant and non-participant observation were used in this research.

3.6.3.1. Participant observation

Participant observation is defined by Jackson (2014) as a study in which the researcher is actively involved in the settings in which the research participants are participating in, but in particular, through the use of undisguised observation, participants were consciously alerted that the researcher would be observing their behaviour (Jackson, 2014). This was where I was asking the village participants to show me how they access water. Again when it comes to the water institutions, an undisguised observation was applied when the officials were informing me about how the water operation works. All the participants were informed of being observed during this process through the clause of the provided information sheet, and could refuse consent.

3.6.3.2. Non-participant observation

The observation of the water infrastructure around the villages did not require me to actively participate in most of the cases. This is why a non-participant observation also known as naturalistic observation was used in this regard. As it is explained in Cargan (2007), a nonparticipant observer observes an organised incident, typically either in a set laboratory setting or the field without any involvement in the scene. I used these naturalistic observations around the villages relating to water. A passive participant takes a form of a bystander in the observation (Spradley, 2016).

3.6.4. Document Review

There was a careful review of the documents related to the context of water access and supply. This is helpful to understand the background of the phenomena that is being researched (Shelly and Rosenblatt 2012). The documents used here were in forms of government reports, books, academic journals, white papers and online media articles. There was a need to review existing materials, as they were references to finding out how people have access to water, how they are affected by this and how water supply occurs and should occur. The documents such as reports aided the course of getting the background of the scenario before going into the field. Secondary data associated with water access and supply was also used to support the collected data from the participants. There were useful media articles found on the actions that previously happened as a result of the water situation in the region in the Moretele region.

In making sure that I understood the positions of the concerned authorities in their responsibility of realising water access to the communities, grey literature and government reports proved to be useful. They were valuable in understanding the water networks involved; the origin of the water and how it is distributed through the various stages until it reaches intended communities in the Moretele region.

3.7. Data analysis

The interpretation of the data was through both thematic analysis and document analysis for all the variables across the data from villages and the associated institutions. In analysing raw data from the three villages, the raw data from the questionnaires were captured and cleaned in table format for each separate village both in Microsoft Word and Microsoft Excel for the respective questions. For each of the three villages, a table with specific variables (such as age group, gender, mode of water access and so forth) was produced to capture short answers and frequencies. The more elaborate information produced from the interviews was written separately and also categorised by the question they belonged under. Keeping all the information to its respective questions was to make sure in the later stage (selective coding stage) this elaborated additional data could easily be integrated to the central core categories accordingly (Payne and Payne, 2004).

Thematic analysis was then used to transform more open, elaborated questions into meaningful themes. In line with open coding, after transcribing the collected data from participants, the data was labelled to highlight items from the raw data that appear important (Payne and Payne, 2004). Thematic analysis then uses these words or expressions to emphasize, identify and describe both implicit and explicit concepts in the data (Guest et al., 2011). It also draws on theoretical categories – in this case, from governance literature (e.g. participation, accountability) and from political ecology literature (history, uneven investment in infrastructure, forms of exclusion, etc.).

The categorised data from the tables and with the addition of the elaborative data were then mind mapped into themes. After this initial brainstorming, core themes were broken down to see what connections they had with each other – axial coding (Payne and Payne, 2004). At this stage, there was a clearer idea of the connected themes and the analysis had reached the selective coding stage

(Urquhart, 2012). Coding was therefore limited to only those categories that relate to the core category (Urquhart, 2012). What was left was to add some of the corroborating information such as how much people pay for water, what the water was used for, how people addressed the water situation in their community, etc. to build a compelling and descriptive set of results.

Data analysis for the related water institutions was done in the same way as it was done for the villages using thematic analysis. The only difference was that the data from the institutions was less dense (with 5 interviews) than the data from the villages and therefore institutional information needed more additional documentation. Codes produced from the MLM mainly focused on the water manner the municipality uses to provide the communities in their jurisdiction with water. The core thematic categories for the CoT were centred on how WSP plays a part in providing water to the MLM. In the later stage of selective coding, categories related to challenges of water supply and future water supply complimented the core themes.

Documents were reviewed when needed to compliment the views received from participants. This was also part of triangulating the data. In the case of the villages, there were instances where what was said by the participants was also covered in the media. During an interview with some participants from Ngobi, I was told that the time when the new reservoir plant was built, the then-president Jacob Zuma and various ministers visited the area. Therefore it was essential to engage in cautious understanding and to re-read the data. Later on the themes that emerged were captured and established into groups for coding and assemblage (Musa et al., 2012). The same process was used to follow up on the water protests that occurred in Makapanstad and Carousel View. When it came to the two institutions, a portion of their data was in the form of documents, including the background of the institutions, how much water gets supplied and future water supply. This information was slotted into the already constructed categories from the analysed interviews.

3.8. Ethical Considerations

Before data collection was conducted for the study I sent a research proposal and binding documents (research questions, consent forms and information sheets) to the University of the Witwatersrand ethics committee where they were assessed for the research to be ethically conducted, and the ethical application was approved (see Appendix 8.1 and 8.2). It is expected that the persons conducting research conform to basic ethical values (Seppet et al., 2011). Ethics in research refers to the norms for conduct that make a distinction between acceptable and unacceptable. Ethical standards help in making sure that people conducting research can be held accountable to the public (Resnik, 2011).

Participants from the three villages (Makapanstad, Carousel View and Ngobi) and the officials from MLM and CoT took part in the study on a voluntary basis and were allowed to withdraw from the study anytime by indicating to me without being penalised. In the same way, they were expected to abstain from the questions they were not comfortable to answer during the interview. As the researcher, I explained to the participants through the information sheet that the aim was to examine the dynamics that shape water access for the Moretele region (see Appendix 8.1 and 8.2). In the process, the participants from the villages were notified of the researcher's name, the name of my supervisor and made aware that I am a student at the University of Witwatersrand conducting research. After the participants from the villages understood the information sheet, I then obtained verbal consent (as provided for by the Wits ethics committee) about participating in the study. Verbal consent, in this case, was confirmed by the participants either saying yes or no, in being part of the research.

In the case of the institutions, before they could agree to be part of the research, I sent them permission request letters explaining what the study was about, what is asked of them and the value the research will add in the field of water

(access/supply). Once I received the permission letters from the institutions, then the letters together with the proposal, participant information sheets, consent forms and instruments were sent to the Wits ethics committee as part of the ethics application package. The Wits ethics committee granted institutional permission on the 14th of September 2017 and I also got the clearance certificate (see Appendix 8.3). During the interview, I provided the officials from the institutions with the information sheets and the consent forms to read, understand and sign before I conducted the interviews.

I explained to all participants that the end product of the research will become a public document since this is a Master's thesis. The village participants were made aware that any of the gathered information from them will not be shown to other people or directly traced back to them individually regarding confidentiality and anonymity. When it came to the institutions, it was made clear that anonymity would not necessarily be guaranteed as the people who will be providing information to me could be identifiable based on their positions. Confidentiality implies that collected identifiable information relating to the individuals in the course of the research would not be revealed without the participants' consent (Wiles et al., 2008). Anonymity, on the other hand, means that the researcher will promise not to publish the names and addresses of those participating in the study and will make an effort to group data in a way that personal characteristics will not be revealed (Brink and Wood, 2001). With the importance of the research for expanding knowledge in the field of water, I made the participants aware that collected data could be used for future related studies (as noted in the participant information sheet), and all the participants had no problem with that. It was made clear that the information will be stored in a password protected external drive and later into a password protected cloud service where no one will be allowed to access except me to make sure that confidentiality is guaranteed. There was a signed agreement in the consent form with the officials from the related institutions that audio-recordings would be destroyed once transcribed.

3.9. Limitations

The challenges of the study included the postponement of meetings with some of the officials, which shifted timelines, as well as confidential institutional knowledge. In some cases the institutions could not divulge further, as some of the information was confidential.

The main limitations of the study are the missing voices of the new WSP, councillors and traditional leadership. I would tried to negotiate access to the new WSP, MW, but was not successful; it was not clear if they were willing to be part of the research or not. Getting information from MW would have been very helpful because CoT informed me that MW was going to be the direct future WSP for MLM, taking over from them. Regarding the future water supply in the Moretele region, we only know of the hydrological plans of how water will be improved. We do not know how MW will do things differently from CoT for better management and supply of water.

Later in the stages of data collection through the revelations from the participants, I realised that I should have included the councillor and royal representatives. These bodies were not initially included in the project as the project tried to understand how the communities accessed water and how the water was supplied to them by the involved water institutions. The views of the councillors would have added the validity to the data as they would have explained the link between the community and the municipality.

3.10. Conclusion

In this chapter, I have given the contextual backgrounds of the sites in which the research took place and the significance of why the study took place in the Moretele region. Through using qualitative and multi-site research designs, it was also explained in detail why specific methodologies were used for this study. This

was followed by a discussion of sampling strategies and participant recruitment. I then elaborated on the methods which were used in the study to collect data from the sample groups – structured interviews, semi-structured interviews, observation and document review. In data analysis, I detailed how both thematic analysis and document analysis were used to interpret the raw data. The methodology chapter concludes by looking at the ethical considerations and limitations. I have given the ethical considerations which I followed to ensure the wellbeing research participants. Lastly in the limitations, I explain how during the course of the study there were incidents which restricted the progress of the study.

Chapter 4: Results

4.1. Introduction

The results chapter is divided into two parts, the first part looks at the three Moretele villages on how they have access to water and the second part looks at the involved institutions supplying water to the Moretele region. The first village is Makapanstad, as the village centrally positioned in the Moretele region and the closet village to the MLM (5.5km away). Next is Carousel View, situated in the south-east of the Moretele region along the R101 road and also opposite the Babelegi Industrial Park. I then present the Ngobi case as one of the northernmost villages located at the northeast of the Moretele region before bridging into the Limpopo province leaving the North West province.

In the first part of each case, I present an overview of how people accessed water from different water sources across four different time periods. That will be followed by an in-depth explanation of the different types of water sources used in each of the villages, their related challenges, and advantages, as well as the villages' relationship with the municipality. The next part of the chapter will look at the roles of MLM & CoT in ensuring water access in the Moretele region. Mainly this will be getting a sense of the associated factors which includes the relationship between MLM & CoT and different modes they use to provide water to the villages. There is an in-depth explanation of the different procedures involved in circulating water from the Leeukraal dam to the TWPP and eventually to the villages. The chapter will conclude with the associated challenges and the water access plans in the Moretele region which involves MW.

4.2. The context for dividing the periods for data collection

The study looked at water access in the three villages based on four time periods: 1994-1999, 2000-2005, 2006-2010 and 2011-2017. I decided that these periods would be used for all three villages as the general guideline based on villages

coming from the same region. Also when looking at the similarities and differences between villages, it would help to compare them based over comparable periods. The questions were structured in a way that participants were asked how they accessed water over time using the four time periods.

The first study period starts in 1994 – the year of democracy and examines the water situation from 1994 until 1999, just after the Water Act came into effect. The South African Water Act was produced in 1998, but its implementation was only viable in the 2000s. The Minister of Water Affairs and Forestry at the time, Ronnie Kasrils, explored an alternative manner to water access based on noticing that people in the rural areas struggled to afford water access. Therefore the 2000-2005 period was selected based on realising that this was the time when changes were set to be implemented in the water landscape of South Africa. Local governments were increasingly empowered from 2000, and the implementation of the FBW supply was implemented in the census year of 2001, therefore, a five-year period from 2000 made sense.

The next period was 2006-2010; 2006 was the time when the new minister, Lindiwe Hendricks, took over from the previous team of Ronnie Kasrils and Buyelwa Sonjica that introduced FBW supply. I wanted to see if the changes that happen at the macro level had an impact on places like Makapanstad and the other two villages regarding water supply. 2011 was chosen to be the start of the last period because it was the year of the last South African census, therefore the previous category, 2006-2010, was a four year period, unlike the first two that had more than five-year gaps. Pragmatically, it seemed a good idea to make a period from 2011 until the end of my data collection year of 2017.

4.3. Makapanstad case study

4.3.1. Introduction and overview

In this section looking at the first case study of the Makapanstad village, there is an overall discussion of water access through different modes in the village of Makapanstad. Table 4 illustrates the overview of water access in Makapanstad classified into four time periods from 1994 until 2017. The table draws on my observations and insights from 15 structured interviews with village residents across a number of sections in the village. This will then be followed by a detailed analysis of the different modes of current water access. In the end, there will be a look at the challenges and advantages associated with water access in the Makapanstad village.

Makapanstad receives treated water from the municipality through household reticulation system and the water tanker services. However, this treated municipal water as a whole is surrounded by challenges of limited capacity related to poor water pressure to be released by the TWPP towards the villages. In this case, there has been urgency by CoT to upgrade both the TWPP and Klipdrift Water Treatment Plant (KWTP) to ensure that there is ample water produced to provide the MLM villages. Therefore in Makapanstad, the common water source that people are relying on has been groundwater in the form of boreholes, to an extent where some residents have installed boreholes in their yards or buy borehole water from those with boreholes.

Table 4: Water sources and access in Makapanstad village over different periods (1994-2017)

Makapanstad					
1994-2017 Periods					
Type of water source	Type of water access	1994-1999 Period	2000-2005 Period	2006-2010 Period	2011-2017 Period
Borehole	Public standpipes (borehole)				
	Privately-owned boreholes				
	Buying borehole water				
Municipal water	Public standpipes (treated water)				
	Self-connection (from public standpipes treated water)				
	Household reticulated water (treated water)				
	Truck water				
Others	Rainwater harvesting				
	Tshwane River Access				

As relating to the above table, what follows is an elaboration on the overview of water access between 1994-2017. Firstly, rainwater has always been used as a supplementary source of water, subject to its availability weather permitting. Makapanstad experienced some drought in 2015. During the drought it was very difficult to depend on rain water plus the water table also dropped which affected the freedom to access water from the boreholes. The 2015–2016 El Niño event, which correlated with drought in South Africa, was associated with prospects of

harsh drought (Baudoin et al., 2017). Accessing water from the Tshwane River was a common practice before the 1990s. However, the practice faded out in the 1990s because of the move to the general dependence on groundwater in the form of boreholes.

Before democracy, the public standpipes (borehole) were in the form of manual hand pumps. People had to travel long distances for this access, and the stations were few and far between. Later some few people moved to the ownership of the boreholes in their yards. Even though some people started to own their boreholes, the format was still manual hand pumps or most of the people in the 1990s and prior. Owners of the boreholes sold the water to other villagers back then and even to this day. Buying water in the 1990s was a better alternative than travelling long distances to access water from the public standpipes (borehole). Buying borehole water has been consistent over the years and is still the standard mode of water access for the village of Makapanstad currently.

Public standpipes (municipality treated water) was introduced in the late 1990s. The water points were positioned close to the main road and few and far between. Currently, few operating public standpipes are producing treated water in the village. In the early 2000s, people saw a chance to be proactive by connecting water pipes into their yards from the main public standpipes. The municipality eventually stopped water supply from these self-connections and installed their taps and meters to ensure that there is a better supply of household reticulated water (treated water).

Currently, household reticulated water supply is on an interval basis, with water supplied only on certain days and at certain times. The westerly part of the village is not getting any supply of this water through their pipes because there is not enough pressure to reach that side. These people and others in the village mainly get municipal water through trucks. The tanker services started around 2010 as an

alternative water source to assist the internal supply of the household reticulated water (treated water).

With this overview, what follows is a more detailed explanation of how people have responded to access water through different water sources available, as well as the related challenges and advantages they face.

4.3.2. Different water sources people of Makapanstad use

4.3.2.1. Groundwater (Borehole water): consistently available water supply

The everyday use of groundwater in Makapanstad is in the form of borehole access. It was said that borehole water is a reliable supply because other sources are inconsistently available. This is despite the local municipality pointing out that the quality of the groundwater in the Makapanstad was not good. 5 of the 15 interviewed people from different households said that in the 1990s they accessed water from the public boreholes and 6 participants indicated that they bought borehole water from the people with boreholes during that time. There was one participant who said that during that time he did both; saying that at home they purchased borehole water from people with boreholes and also collected water from the public boreholes. It appears that accessing water from the public borehole stopped in the early 2000s as none of the participants mentioned the dependence on this source from the 2000s onward. This is when the municipality stopped the water supply because people were self-connecting from the public standpipes into their homes. As obtaining water from the public boreholes ended, the buying of water from people with boreholes continued in the period of 2000-2005 as 7 participants accounted for this. The trend of buying borehole water somewhat decreased between 2006 and 2010 as only 1 participant claimed to have used this manner in that period. This was the period just after the municipality had stopped the access to the self-connected pipes and MLM installed their taps and meters in households in Makapanstad. As other participants mentioned, this was the time (2006-2010) when municipal household water was better. The

dependence on purchasing water from the people with boreholes became higher again in the 2011-2017 period with 12 of 15 participants claiming to be dependent on this manner of access.

As borehole water continued to be a reliable 'available' source of water in Makapanstad this also saw the borehole installation business growing in the village. Based on my honours research observations in 2016 to the 2017 during the data collection, the number of people who installed boreholes in their yards has increased. During my visit to Makapanstad, there were a couple of posters on the street poles advertising water drilling (Figure 16). Even though only 3 of the interviewed participants accounted for owning boreholes, based on observations, a good number of houses had tanks on stands to store the extracted borehole water. Also, a participant from the northern part of the village said that as a growing number of people have resorted to owning boreholes, this has also helped those who cannot afford to do so as now there are a number of people they can now collect water from. I could have gone to many homes with boreholes but based on my honours' findings the results of the people who owned boreholes were similar, and people were basing their decision on the fact that municipal water is insufficient. Indeed, the three people who owned boreholes in their yards indicated that to be the reason they installed boreholes in their homes. By the looks of it, borehole water is a more reliable water source than the other water sources, and a resident from the greenside section also confirmed this.

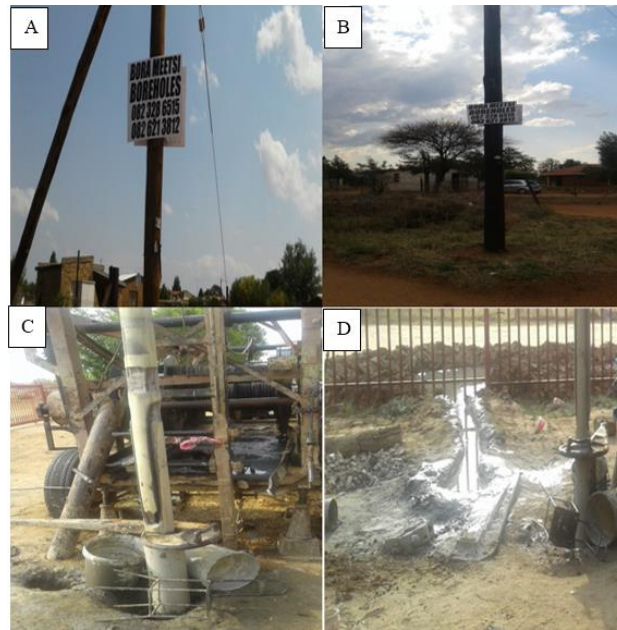


Figure 16: Advertisement of drilling borehole water (A & B). Water being drilled in the home one of the participant (C & D).

Photo: Motshwaedi Sepeng (researcher)

4.3.2.2. Collecting water outside one's home

When people cannot get water in their yards, they are forced to leave their homes and to look for water outside their homes. The vulnerable groups are the ones hit hardest by the lack of municipal water access in their yards. The South African Department of Water and Sanitation has agreed that the minimum quantity of fresh water per person per day should be 25 litres and the maximum cartage distance should be 200 metres from the household (Myburgh et al., 2018). The majority of the interviewed people who collect water outside their homes stated that they do the collection of water themselves. Also, some people were older than 60 years who were collecting water themselves, and there were cases where children were the ones collecting water. There were also two cases of people being unable to collect water as a result of their disabilities.

It was mentioned that to access water feels like work: people have to wait in queues and push wheelbarrows. Distance could also be a problem depending on

the distance people have to travel to buy water from or how far water points are from where they collect truck water. However, based on the observations, as a result of more people owning boreholes, it could mean that there are enough homes with boreholes to buy water from so distance might currently not be a big problem. It was mentioned by some of the participants that borehole owners charge R2 per 20-litre container. However, on the other hand, it could still happen that there are houses that have boreholes but do not sell their water based on the low accumulation of water from their dug boreholes which forces them not to sell. In that case, it could force people to buy water somewhere further than their homes.

4.3.2.3. Municipal water: desirable source, yet undependable

There is an inconsistency of reticulated water supplied; some sides of the village cannot access it. Following the decline in the dependence on the public borehole water, then public treated water took over, and this was in the form of standpipes. The municipality initiated the public standpipes (treated water) for the community to access water from. 7/15 participants indicated they had made use of the public standpipes (treated water) during the 2000-2005 period. It was said that these standpipes were very far from some people's homes, so they had to travel long distances to access water from the standpipes. This period also saw the beginning of the trend of people starting to self-connect water from the public standpipes into their homes. 2 of the 15 participants mentioned that they began to connect water from the public standpipes (treated water) into their yards from 2000-2005 while 6/15 started the self-connection in the 2006-2010 period. Some participants said that the government then stopped the water supply entirely as a result of the increase in self-connections.

Some of the participants mentioned that the municipality then installed their pipes, taps and meters in their yards without charging them any money. The old taps were not destroyed; water was no longer coming out from them but only from the new government taps. All six interviewed people from the first sections of the

west of the village complained that ever since the taps have been installed into their yards, they have always had this problem of the municipal water reaching them. In the other sections of the village, people complained about the interruptions related to the reticulated municipal water. In this case water interruptions mean that the municipality reduced the supply of water in the pipes or shut off supply at certain times due to less capacity from the water plant. As the case for this, there is less dependence on the reticulated municipal water as only two participants depended on this supply during the 2006-2010 period, and only three claimed to rely on this supply during the 2011-2017 period. The main thing that was said by the people who depended on reticulated municipal water was that the supply of this water was on an interval basis. Even though there are many shortfalls associated with municipally treated water, all the participants unanimously said that this would be their most preferred source of water should it be clean and consistently supplied. Ten of the people then went on to say that they would not mind if they would pay for their reticulated water if the water supply was consistent.

4.3.2.4. Truck water: the municipality's alternative water supply

The interval availability of municipal reticulated water or the complete drying of taps in some parts of the village has introduced a new mode of supply; the delivered water supply. The water is transported through tanker trucks by the municipality to the community (Figure 17). Water is collected by trucks from the TWPP. The collected water is then transported to the different villages which cannot get good supply of reticulated water into their yards from the TWPP, such as Makapanstad. Once the trucks arrive at a particular village, then the water is delivered to the various water stations in the village. At a specific station, there is a stationary tank placed on the ground to store the water. Then a truck will pour the water into the roughly 5000-litre vertical tank (see Figure 18). Once the tank is filled with water, then the truck leaves. The gathered people will access their water from this filled tank. 6 of the 15 interviewed people indicated they were dependent on obtaining water from the trucks in the 2011-2017 period.



Figure 17: A water tanker delivering water to a water point in Makapanstad

Photo: Motshwaedi Sepeng (researcher)



Figure 18: A water truck at a water point in Makapanstad pouring the water into stationary tank

Photo: Motshwaedi Sepeng (researcher)

4.3.2.5. Rainwater: for drinking, other water for everything else

All the interviewed participants indicated that they still use rainwater as a supplementary water source except for one participant. There was a participant who said that the taste of rainwater was the most pleasant, but the only problem is that the supply is dependent on rainfall, which is inconsistently available. One of the participants who owned a borehole said that preferably she uses borehole water for other activities then rainwater for drinking. There were a couple of people in the village who had tanks attached to their roofs to collect rainwater. This was the only method of rainwater harvesting the participants shared with me.

4.3.3. Water challenges faced by the people of Makapanstad

4.3.3.1. Challenges related to rainwater

Rainfall is not quite prevalent in Makapanstad throughout the whole year; therefore it becomes difficult to depend on it. That is why people said they used rainwater as a supplementary source. Makapanstad does experience significant seasonal fluctuation in monthly rainfall. South Africa has an annual average rainfall of 450 mm per annum (CSIR, 2010). The North West, the province which Makapanstad falls under, is considered to be semi-arid with an approximate annual rainfall of 539 mm (DEA and GIZ, 2015). The yearly wet periods last for approximately eight months, starting from mid-September to early May. The majority of the rain comes around mid-January, with an average total accumulation of 3.4 inches (86.36 mm). (Weatherspark, n.d.) . The annual dry season with a lack of precipitation lasts for just over four months, starting from early May to mid- September. Around that period, periods of no rainfall are experienced around mid-July (Weatherspark, n.d.).

4.3.3.2. Challenges related to borehole water

The one major problem that was mentioned related to borehole water was that it is very salty and that the water level can decrease especially when it has not rained for a while. In the interview with the local municipality, they mentioned that the

public borehole system service, which was provided by the municipality to the Makapanstad community, was stopped as a result of their evaluations indicating that groundwater in Makapanstad is not of good quality. Some of the participants from Makapanstad were aware that the borehole water they were drinking was salty but did not have any choice. A participant said that one of the reasons that they decided to install a borehole in their home recently was because the truck water they used to access was dirty. In work done by Mpenyana-Monyatsi and Momba (2012, p. 908), there was an indication that Moretele region is amongst one of the regions in the North West province with high sodium levels.

4.3.3.3. Challenges related to municipality treated water

Some portions of the village get access to municipal treated water in their yard, and some parts of the village do not. The problem varies from section to section; during the data collection, the prevalence of lack of the availability of the reticulated water was quite high in the western part of the village. As will be explained later in this chapter, one of the reasons that prevent some portions of the Makapanstad village from getting water is a lack of capacity from the TWPP. Additionally to the problems of interval supply, one participant mentioned that when the reticulated water is available, then the water sometimes did not taste pleasant.

4.3.3.4. Challenges related to truck water supply

Just like the interval nature related to reticulated water supply, some participants said the same about the truck water supplied. One participant from the west side of the village said that the trucks come once or twice a week to deliver water in their section. When the delivery is delayed, then people depend on buying borehole water or use rainwater. This was similarly voiced by the six people who were using the truck water in the 2011-2017 period. They also used other supplementary sources when there is a delay in the water to be transported.

One of the problems related to the truck-supplied water is that the water delivered is limited and therefore it does not cover everyone. One of the participants said that this is humiliating as people have to run around with wheelbarrows carrying 25-litre containers when they see the truck approaching the delivery station. There was a grandmother who said that it is embarrassing when 'they' the old people have to do this. To add to the problem, a disabled lady felt that this mode of access makes it hard for people in her condition to access water. Another issue related to the truck water supply is that the water points are few and far between in the village.

I was told that those who want truck water to be provided directly to them are charged for this service. It was said that there was a time when the community decided to protest against the lack of water service in the village and a participant noted that in particular, they were protesting against the undignified mode of water service through trucks. As the *Moretele Times* reported:

“Makapanstad Members of ward 17 revealed their frustrations as they attempted to close down the main road from Makapanstad to Mathibestad on Friday 25th August 2017 because of the municipality trucks not delivering water in their various water stations” (Staff Reporter, 2017, p.1).

4.3.3.5 Will the people be able to afford to buy water?

According to the municipality's Integrated Development Plan (IDP) of 2016/2017, the indication is that there is a high rate of unemployment in the Moretele region (MLM, 2017). It could still be difficult for people to easily access clean water should it require payment. Some of the participants mentioned that the taps and meters were installed for free by MLM. However, there is a portion of the village that have alluded to buying borehole water from their fellow villagers. 12 of the 15 interviewed people were reliant on purchasing borehole water from other villagers between 2011 and 2017 based on the collected data. All this could mean that once the water capacity problems are solved from the plants, then another question could be the ability of the villagers to pay for water.

4.3.4. Water advantages associated with Makapanstad

Even though not all of Makapanstad is getting consistent water supply from the municipality, this village is not far from the water source and the local municipality offices. It takes about a 10-minute drive to get to the offices of the local municipality situated in the next village (Mathibestad) which is 5.5km away. The difference is big when compared to the other two villages in the study (Carousel View and Ngobi) that have average distances of 17km and 30km respectively from the offices of the local municipality. Makapanstad and Carousel View are also closer to the TWPP with distances of 32km and 10km respectively when compared to Ngobi which is 60km from the plant. This is significant in that upgrades to TWPP's capacity will benefit nearer villages more in terms of pressure and cost of distribution. The other advantage of being close to the offices of MLM is that when the community have grievances, they can travel just a few kilometres to get to the local municipality when compared to places further away.

4.3.4.1. The freedom to use the accessed water

It seems that owning a borehole is like gold in this inconsistent water supply scenario. Indeed the three people who owned boreholes in their homes said that this enabled them to have gardens in their homes; this is something that people without reliable household water supply could not afford to do. For people with a lack of sufficient water supply, the little water they collect would need to be prioritised for essential activities such as drinking, bathing and washing. Those with boreholes also have the power to sell their water to those who do not have.

When available, household municipality reticulated water can afford people flexibility. There was a person who said that the time the government water was consistently available to them, they were able to do many things. This freedom to use water differed by the manner people have access to water from the different sources. A participant said that buying borehole water does not allow them to

collect as much water as they want as they have to be considerate and not greedy to the people they go to collect water from. Additionally, this is to make sure that they do not become a nuisance to the people they buy water from. As a result of the problems of the availability of water, the people who collected water from outside their homes have indicated that the collected water was used sparingly to last them longer. In this regard, 200-litre drums or 20/25-litre containers which the residents have provided themselves play a significant role in storing the collected water.

4.3.5. The state of Makapanstad water infrastructure

The reservoirs in Makapanstad have never been in operation according to some of the participants from Makapanstad. CoT and MLM have explained that the reservoirs in Makapanstad are currently not supplied with bulk water as they are waiting for the completion in the upgrading of the TWPP and the KWTP which will provide better water volumes (see section 4.11). After completion then the water will be pumped into the Makapanstad reservoirs shown in Figure 19. This means that the water that currently comes from the TWPP to Makapanstad moves directly through pipes from the plant into the pipes supplying yards and standpipes. Through informal conversation and interviews, some people in Makapanstad said that the 'Makapanstad reservoir' had been repaired a couple of times before to a point where people had even thought that the reason for the lack of water in their village is because of leaks in the reservoirs.



Figure 19: Makapanstad water reservoirs

Photo: Motshwaedi Sepeng (researcher)

In my visit to Makapanstad, most of the public standpipes were not working. Based on my observations, I was able to see two working standpipes situated in the north of the village with one close to the taxi rank. Other infrastructure I viewed which were used for the standpipes were not working if not vandalised as seen in Figure 20 A & B. Even though the water had stopped in most of the standpipes in the village, it looks as if the vandalising and stealing of the tap (valves) might have also contributed (Figure 21 A & B). A participant mentioned that this was a trend where thieves were stealing taps which were installed by the government in people's yards. The tap (valves) are stolen as they are mainly made from copper and later sold to the scrap metal dealer where they are weighed in before they are recycled or as they say 'kalisa' (which means to weigh). This has then forced some of the residents to alternatively use plastic tap valves like the one shown in Figure 21 (C). In some of the households, people did not bother to replace their stolen taps, and they would control the water from the meter using pliers.

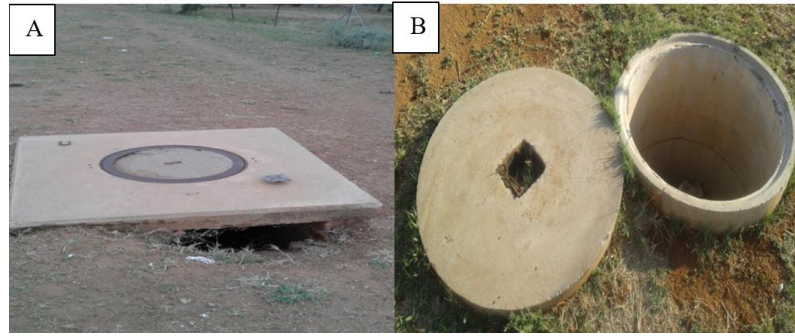


Figure 20: Neglected (A) and vandalised public water infrastructures (B)

Photo: Motshwaedi Sepeng (researcher)

Based on the observations and interviews, I found out that the tanks attached adjacent to the public standpipes were also vandalised during protests and not replaced. In the case of the water tanks, it was said by a couple of participants that the tanks were burned during the water protests pictured in Figure 22. Indeed *Moretele Times* also reported on this, pointing out that the angered protesting residents burned the tanks to highlight their level of frustration on the water situation without yielding any response from the municipality (Fothane, 2017). Other public water structures like at the site of the reservoirs seem to have been left to deteriorate ever since the public water access has declined (Figure 19).

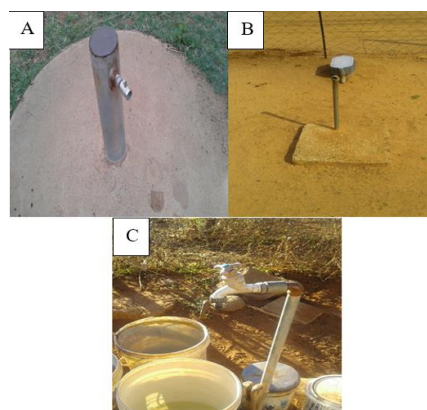


Figure 21: Public standpipe without a valve (A). Household water tap without a valve (B). Plastic tap in one of the households' yards in Makapanstad (C)

Photo: Motshwaedi Sepeng (researcher)



Figure 22: Burned public water tank as a result of the water protests

Photo: Motshwaedi Sepeng (researcher)

4.3.6. Residents' relationship with the municipality around water

A participant said that the municipality invites people to their meetings through a vehicle with a loudspeaker. Another participant (a grandmother) told me that usually, the old people are the ones attending those meetings, rather than the youth. Based on listening to what participants were saying, there seems to be poor communication between the municipality and the community; most people did not know about the plans of the municipality when it comes to water. People were speculating about why they are not getting consistent reticulated water in their yards. There was a portion of people who believed that the water they access, either from their taps or from the trucks, came raw straight from the Tshwane River. The reason behind that, especially for the people accessing water from trucks, is that it was said that the delivered water is not clean enough and therefore

the water gets spoiled over time. On the other hand, some people correctly knew that their water was coming from TWPP. Even though some knew where their water was coming from, they still did not understand why the water situation in their village was not improving.

The main echoed plea from the participants was that they just wanted the consistent supply of municipal water in their yards, but different people had different takes on this. A participant accessing water from the trucks said that their wish is to see water access through trucks ending: 'Away with trucks and in with a consistent water supply'. Among others truck water supply was also one of the reasons why there were protests in the first place, saying that trucks were not consistently supplying water to them.

One participant mentioned that the government should pay for all the water installations, although the municipality has already installed the taps and water meters in the yards of people. Concerning the subject of payments, five of the participants said that they would not be prepared to pay for water should the government force that on them. Ten of the people did not have a problem with paying for the water provided that the supply is sufficient. Among the participants, a fair number of them did not see a problem with paying for water because they are already buying borehole water. The willingness to pay would also depend on how much the provided water would cost.

4.4. Carousel View case study

4.4.1. Introduction and overview

In the following section, there will be a discussion of the history of water access in the village of Carousel View across the four periods based on the views of the 15 interviewed participants and my observations. The section will start with analysing water access when people were still in Bosplaas and proceeding to how people accessed water when they arrived in Carousel View in the 1990s. Following that there will be an analysis of water access when the realisation of water was established in Carousel View. Lastly, the section will look to paint a picture of how the people in Carousel View currently access water. The analysis will conclude by highlighting the related challenges and advantages in regards to the setting of Carousel View and how water is received, and also how people relate to the municipality around water provisioning.

Table 5: Water sources and access in Carousel View village over different periods (1994-2017)

Carousel View					
1994-2017 Periods					
Type of water source	Type of water access	1994-1999 Period	2000-2005 Period	2006-2010 Period	2011-2017 Period
Borehole	Public standpipes (borehole)				
	Privately-owned boreholes				
	Buying borehole water				
Municipal water	Public standpipes (treated water)				
	Household reticulated water (treated water)				
	Buying or free collecting water from residents in Ramotse village				
Others	Rainwater harvesting				
	Tshwane River Access				

Rainwater has always been used as a supplementary source of water in the past but not that much currently. Some participants in Carousel View mentioned that they used to access water from the Tshwane River while staying in Bosplaas in the 1900s and before that. But the access from the river eventually died out as the water was not particularly clean. Another mode that was commonly used when the people were still in Bosplaas is groundwater, and at the beginning, it was mentioned that access from this mode was through public standpipes (borehole). As time went by then a few people started to own boreholes in their yards. None of the participants mentioned people they know owning boreholes in Carousel

View currently. Still in Bosplaas, following the ownership of boreholes in the yards, then water would be sold to other villagers.

Interestingly some people mentioned that immediately after they arrived in Carousel View, around the 1990s, they used to cross the railway line to go into Bosplaas to buy the borehole water. Eventually, public standpipes (treated water) were installed at particular corners when people arrived in Carousel View in the 1990s. During this time when people had just moved into Carousel View, they were living in shacks. Public standpipes (treated water) were a common source of water before 2006 until household reticulated water was initiated and distributed. Following the building of the RDP houses around 2006 then the people were provided with household reticulated water (treated water) together with pit toilets. Household reticulated water experiences occasional interruptions; as a result, currently, there are still people especially in sections C&A who access water at the public standpipes (treated water) in front of the Carousel Hotel. Another alternative during interruptions in Carousel View was for the people in the B section to collect freely or buy water from people in the village of Ramotse who also have household reticulated water (treated water).

4.4.2. Different water sources people of Carousel View use

The majority (10/15) of the people interviewed in Carousel View indicated to have stayed in Bosplaas before moving to Carousel View. Bosplaas is the village opposite Carousel View on the west which is separated by a railway line (Figure 12). 9 of the 15 people interviewed answered that around the 1990s, and before they had taps in their yards, they used to get water from the public borehole in Bosplaas and three indicated that they bought the water from the people with boreholes around Bosplaas village. Even though people did not talk in detail about the use of rainwater, those who did referred to it as a supplementary source rather than the primary source. Based on observation there was no indication of water harvesting setups with downpipes connected to the roofs to store rainwater in

most of the houses in the village but again, RDP houses do not come with that setup.

4.4.2.1. Standpipes during the transition to RDP houses

According to two participants, in the 1990s just before the RDP houses were built, there were shacks erected parallel to the R101 road while the inner space of the village was left vacant for the construction of the current RDP houses. During the days of the shacks, standpipes were installed at different corners in the village for people to access water. 6/15 of the participants repeated using these public treated water standpipes between the periods of 1994-1999 & 2000-2005 before they had reticulated water in their yards. Three of the participants accessed their water from the Carousel View standpipes in the 1994-1999 period; two other participants used the standpipes in the 2000-2005 period while one participant used these public standpipes across the two periods (1994-1999 & 2000-2005). However, some people said that they also managed to access water from the Bosplaas village. In particular, to my surprise, there was a lady who said that it was tough in those days as they would occasionally load their containers on top of their wheelbarrows and carefully cross the railway line to collect water from Bosplaas. Based on my observations it would be difficult to collect water from Bosplaas because of the railway line that separates the two villages (see Figure 23 below).



Figure 23: Railway separating Carousel View (right of the railway) and Bosplaas East (left of the railway).

Photo: Motshwaedi Sepeng (researcher)

4.4.2.2. The realisation of reticulated water in the mid-2000s

When it comes to the realisation of water access in Carousel View, it was said that only after the RDP houses were completed, it was then that around the mid-2000s people were moved from the shacks into the newly built RDP houses with reticulated taps. Even though most of the participants could not remember the exact date, all 15 of the participants indicated that the reticulated water system was in place around the period of 2006/7.

It was said that the installation costs for the taps, pipes and water meters were taken care of by the municipality. It was explained to me that the first group had free water installation but the people who came to Carousel View after the municipality had rolled out the free installation had to pay privately for their installation. All except two participants said that they did not have to pay for the installation of their reticulation system as the government did that for them. Of those who paid for their installation, one said that the municipality was taking a long time to install a tap in her house once they installed her water meter; therefore she ended up buying and installing the tap herself. Another participant said she was a recent resident and explained to me how she could not afford to pay R1500 for the installation of the tap in her yard. She was then forced to connect from a neighbour's pipe illegally. Concerning payments, it was also mentioned by all the participants that the reticulated water they access is for free.

4.4.2.3. The current situation of water access in Carousel View

The problem that people have been having with the government water is that there have been water interruptions associated with it ever since its inception. A participant mentioned that the reason they were forced to strike in 2017 was to address the water interruptions. Currently, people are content with the water supply because as a result of that strike there are no frequent interruptions. Even though currently the water supply is constant in Carousel View, some homes had

2500 litre tanks outside their houses to store the water just in case there were water interruptions (Figure 24).

The residents on the B side of Carousel View which occasionally collected water from the opposing village of Ramotse when there are water interruptions. Initially, I had thought that Ramotse residents had constant access to water and also paid for their water. But based on my later findings through informal talks with people around Carousel View, I discovered that Ramotse was also in the same boat as Carousel View regarding the supply and the access of water.



Figure 24: A yard in Carousel View displaying a tank to store water, a water tap and meter

Photo: Motshwaedi Sepeng (researcher)

4.4.3. Challenges related to municipality treated water in Carousel View

As highlighted before, water interruptions have been a common concern in Carousel View. The middle section (C) which is opposite the Carousel Hotel has

an advantage on the days when there are water interruptions because the people there can easily cross the R101 road and go to collect the water from the standpipes in front of the hotel (Figure 25). The A section which is north of the village is also not that far from the Carousel Hotel when compared to the B section south of the village. The B section (which is close to the Babelegi Industrial Park) is at a distance from the public standpipes in front of the Carousel Hotel which is north of the village. The people on this side have a disadvantage of accessing water as they have to go across the R101 road to the households in Ramotse to ask for water. In this regard, there is less freedom to access water when collecting water from people's houses than just going to get the water from the public standpipes where there is no obligation.

Based on my observations, travelling to collect water from the houses in Ramotse village and also from the standpipes in front of the Carousel Hotel would be very dangerous. The danger is that people have to cross the busy R101 road to get to the other side with the purpose of collecting water. Some participants (6/15) mentioned that children are sometimes the ones collecting the water. Therefore, the danger is more for children. The R101 road is a very busy road as it connects Limpopo, Gauteng and North West provinces, so there is the constant presence of cars especially big trucks transporting goods.



Figure 25: Standpipes in front of Carousel Hotel (A & B)

Photo: Motshwaedi Sepeng (researcher)

4.4.4. Water advantages associated with Carousel View

The Carousel View community has reticulated water in their yards with a reasonably good supply of water for free. Therefore this affords individuals the chance to use water freely. Figure 26 shows things that people of Carousel View can do as a result of having a consistent water supply, such as gardening and recreational activities. Since the strike that happened in 2017, people reported that they have not experienced any water interruptions. This has afforded the people the freedom to use water at whatever time they want.

Carousel View has an advantage of being close to the Babelegi Industrial Park, which also get its water supply from the Babelegi reservoir. According to an official from the TWPP, the Babelegi reservoir is situated at the end of the Marokolong village close to the Magalies Water (MW) KWTP. However, there was a participant who suggested they may experience water interruptions in the dry season since the reservoir at the end of the Ramotse/Marokolong village, loses much water from leaks.



Figure 26: Plastic swimming pool connected to a household tap (A). Planted fruits and vegetables respectively (B & C).

Photo: Motshwaedi Sepeng (researcher)

4.4.5. Residents' relationship with the municipality around water

In 2017 when I first visited Carousel View, I was told that there was a time when the residents of Carousel View took to the streets to protest against poor water service delivery. The protest was said to be directed at the municipality and the councillor. The feeling was that the municipality was not listening to their water grievances. There was a participant who said that villagers were not even informed that the water interruption was going to be longer than what they had experienced. Another participant mentioned that the municipality is also two taxis away from them, therefore, getting there to communicate with them is not easy.

4.5. Ngobi case study

4.5.1. Introduction and overview

The case study of Ngobi will start by presenting a timeline of water access in the village of Ngobi around the 1990s until 2017. This will be based on the collected data from the 15 participants' accounts during the interviews and my observations. Even though the target was to start from 1994 (at the dawn of democracy), people in the village were willing to also talk about how they accessed water before 1994 which was relevant to current water access. The time periods for Ngobi have been kept the same as those from Makapanstad and Carousel View to make sure that there is consistency to compare the three villages equally. Lastly, as groundwater has been the most consistent water dependence in the village; there will be an in-depth discussion of the different forms in this regard.

Table 6: Water sources and access in Ngobi village over different periods (1994-2017)

Ngobi					
1994-2017 Periods					
Type of water source	Type of water access	1994-1999 Period	2000-2005 Period	2006-2010 Period	2011-2017 Period
Borehole	Public standpipes (borehole)				
	Privately-owned boreholes				
	Buying borehole water				
	Self-connection (from refurbished public borehole standpipes)				
Others	Transactie Well Fields water				
	Wells access				
	Rainwater harvesting				

Water access through wells has been an everyday water use in the village of Ngobi even prior to the 1990s. However, well water access is still being used to this day especially for the people who cannot afford to access other modes. Public standpipes (borehole) in the form of manual hand pumps were also used as a conventional access mode in the 1990s and prior to that. A problem related to the public standpipes (borehole) was that they were few and far between resulting in long queues at the stations. The public standpipes (borehole) have since been refurbished. A handful of people who could afford them installed manual hand pump boreholes in their yards to avoid fetching water from outside their yards.

The introduction of electricity in the village saw the pumping of boreholes move from manually pumped to using electricity. Just like in the other case in the study, this water was also sold to other villagers. It was said that water was sold for about R2 per 20 litres container. Currently, the people close to the refurbished public standpipes have been permitted by MLM to self-connect from the public refurbished standpipes into their yards. Another of the municipality's water development projects is the establishment of the Transactie Well Fields water supply which is supposed to be supplying a number of villages in the north of Moretele region with water. Strangely none of the participants mentioned accessing water from this setup currently.

4.5.2. Different water sources people of Ngobi use

4.5.2.1. Public borehole water

In the 1990s and even before that, borehole water that the people used to use was in the form of manual hand pump boreholes, where people would gather around a water spot to access water. A participant who now owns a borehole said that in the 1990s, because the public borehole water points were overcrowded, his family installed a borehole (manual hand pump). When the village began to have

electricity, it was then that their manual hand pump was eventually upgraded to operate through electricity. 6 of the 15 interviewed participants indicated to have used the public boreholes during the 1990s period. 2 of those 6 participants who used the public borehole standpipes in this period said that they solely depended on the access from the public borehole standpipes during that time, while 4 of them said that they accessed water from the public borehole while also depending on a well as a source.

The number of people that depended on the public boreholes decreased during the 2000-2005 period as only 3/15 of the participants said they solely depended on this source at the beginning of the new millennium. The number of people who depended on public boreholes remained the same during the 2006-2010 period as the previous period. For two of the individuals, it was the first time they had indicated using this source, but still, 3/15 claimed to have solely used the boreholes during this period just like in the 2000-2005 period. Some people moved from wells to accessing public borehole water to either owning and or buying water from people owning boreholes.

4.5.2.2. The refurbished public borehole and self-connection

The old public boreholes points have been refurbished (Figure 27) by the municipality and according to some of the participants, the community members were allowed by the municipality to self-connect pipes into their yards from these mains. In the 2006-2010 period, there was a real increase in the number of people who self-connected from the refurbished public boreholes into their yards. 7/15 of the participants claimed to have solely depended on the access from self-connection from the refurbished public boreholes during this period.

The public boreholes were far from some of the houses. Therefore it made sense when some of the people said that in the new refurbished system, water could only reach people close to them and the ones further from those water points such

as the ones staying across the road have a struggle in this manner. In the 2011-2017 period, the number of people accessing water from self-connection from the public boreholes decreased by two as now 5/15 people said to be obtaining their water in this way.

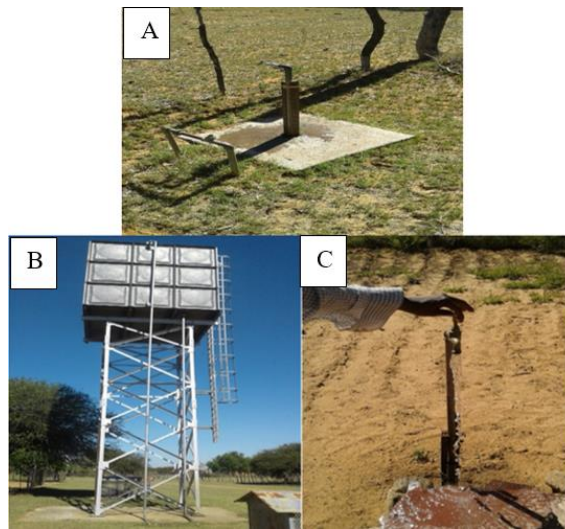


Figure 27: Functioning public tap connected from the public borehole structure (A). Public borehole structure (B). Household tap connected from the public borehole structure (C).

Photo: Motshwaedi Sepeng (researcher)

4.5.2.3. The Transactie water set-up

Transactie is a village opposite Ngobi separated by a gravel road, and this is where the municipality has placed the water plant, known as the Transactie bulk water reservoirs. The basic setup of the plant consists of the main reservoir where the extracted water gets stored, connected to a host of well field stations (Figure 29 (A)). I was told by a local municipal official who accompanied me to the plant, that there are 11 well field stations (Figure 28) situated in the forest on the outskirts of the village. They extract water from the different well field stations depending on their schedules and then transfer the extracted water to the main reservoir in Transactie Figure 29 (A). Through this process, the extracted borehole water gets desalinated Figure 29 (B), before it can be used for consumption. The

time when I was at the plant with the official from the local municipality, I was told that the water produced from the Transactie plant was supplying most of the nearby villages around, which included Ngobi.



Figure 28: One of the extraction stations situated in the forest north of Ngobi and Transactie (A&B)

Photo: Motshwaedi Sepeng (researcher)

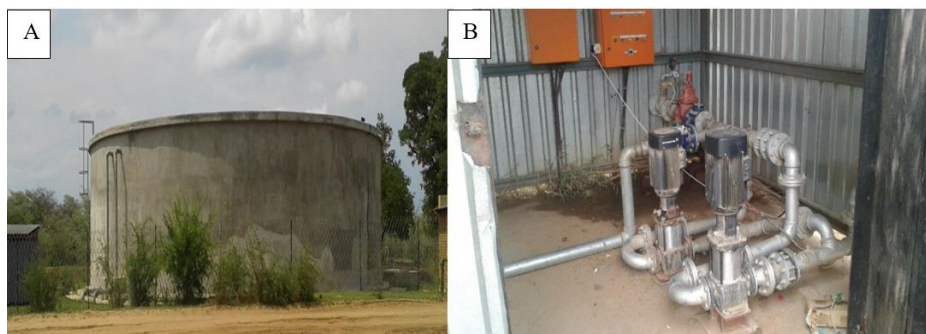


Figure 29: Transactie reservoir plant structure (A). The machine used to purify the extracted borehole water (B).

Photo: Motshwaedi Sepeng (researcher)

4.5.2.4. Self-connection from Transactie pipe line

One of the participants revealed that water from the current supply in the form of the Transactie boreholes or the refurbished public boreholes does not reach their side of the village and that is why they have decided to install their borehole in 2007. Based on the reasons for some participants, the increase in boreholes is

because the water supply either from the public borehole mains or from the Transactie mains cannot reach them. Based on my observation, similar to Makapanstad, the people who could afford to pay for boreholes were those with bigger houses. Of the three people who indicated that they have boreholes, one of them said that he spent around R18 000 to install a borehole.

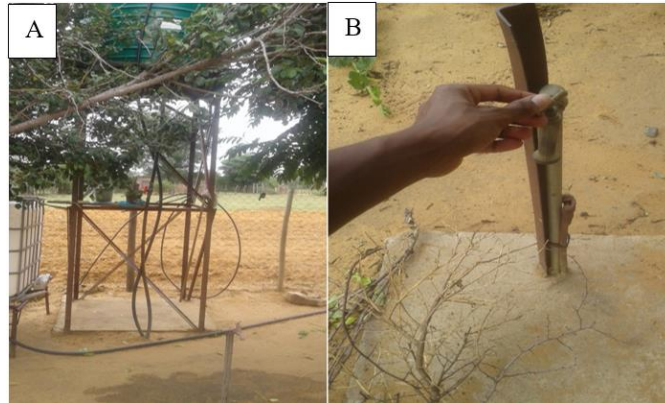


Figure 30: Functioning borehole water tap with a stand inside on of the yard of the participants (B): Household tap connected to public borehole standpipe, but now has not water coming out (B).

Photo: Motshwaedi Sepeng (researcher)

4.5.2.5. Ownership of boreholes

Based on what was observed currently, there are a number of people who own boreholes in their yards as shown in Figure 30 (A). However, of the interviewed people, two out of 15 participants indicated that they owned boreholes in their yards since the 1994-1999 period, and continued to use them during the 2000-2005 period; one of them also self-connected from the public borehole pipe during the later period. The number of people who owned boreholes increased by one (3/15) during 2006-2010, and this was constant into the 2011-2017 period.

4.5.2.6. Buying borehole water

Residents close to those who own boreholes said they buy water from them. In the 1990s only one person purchased this water. During 2000-2005, the increasing trend was people buying borehole water in this way (6/15 participants). Of that six, four of them solely depended on this while two were also depending on wells. For the 2006-2010 period, this decreased to only 2 out of 15 participants. One participant depended on buying borehole water as an additional mode to the use of wells. Then it increased back to 5 in 2011-2017 with 2 also using wells. The dependence on buying water from the people who owned boreholes increased from two in the 2006-2010 period to five as 5/15 people indicated to be still buying water during the 2011-2017 period. Of the five that claimed to be buying borehole water, two of them suggested to have also been using the wells in this period but also demonstrated this to me (Figure 31).

It was also mentioned that access is limited as people feel that they cannot collect water from other people regularly, as it would become an annoyance. It was hard to understand how people will be able to push wheelbarrows with full water containers in the soil that looked to be very heavy even to walk in. A participant said that the collected borehole water she buys is poured into a 200 litre drum outside her house. This was to make sure that the water would last the family a day or two since there were a couple of them in the household and the water was used for many activities. Of the five people who said that they currently collect borehole water from other people, three said that they pay R2 per container and one said he pays R1.50. There was only one person who said that she collects the water for free from her neighbours.

4.5.2.7. Digging of wells

In Ngobi a number of people said that they used to get water from the wells before democracy. 9 of the 15 participants indicated that they used to depend on wells as the source of water during the 1994-1999 period, 4 of whom said that they used

wells as the additional source. The use of wells decreased during the 2000-2005 period with 6/15 participants claiming this because people turn to other modes like public borehole standpipes and buying borehole water from other people. Of that six which depended on wells access during that period, four of them solely relied on well access. In total, 5/15 participants claimed to have used wells during the 2000-2005 period; three of the people solely used wells as their primary source, and the other two bought water on top of their dependence on wells.

Most of the participants claimed to have used wells at some stage in their lives. The sandy loam soil in Ngobi makes digging wells easier. This is primarily those who cannot afford other water access methods. The two interviewed people mentioned that they dug wells to access water to use for their home activities, but the only problem is that the extracted water is limited. Each of the individuals showed me how they obtained water from their wells (Figure 31).

Less mentioned was the dependence on rainwater, despite the visibility of drums attached to roofs with downpipes outside people's houses. These were bought and installed by individuals. In practice, drums are mainly used to store collected groundwater, and less often rainwater.



Figure 31: Through dug wells water is accessed in Ngobi (A, B, C &D)

Photo: Motshwaedi Sepeng (researcher)

4.5.3. Water advantages associated with Ngobi

As a result of the composition of the soil in Ngobi being sandy and loam-like, it is not tremendously hard to dig for groundwater as it would be in the other places like Makapanstad and Carousel View. Drilling wells in places like Makapanstad and Carousel View was unheard of.

Most of the participants said that the accessed water was used for basic things such as cooking, drinking, bathing and washing. On the other hand, those that have boreholes or those who still have access to public water in their yards; they would occasionally use the water for gardening. Three people said that the water they accessed was not enough because they have to share it with their cattle.

4.5.4. Water Challenges faced by the people of Ngobi

Water is a big challenge for those who are not close to the public borehole mains or close to the Transactie pipeline connections. These people are forced to either buy water from people who own boreholes or to dig their wells to extract water. It was said that digging of wells does take a toll on one's body. One of the participants who relied on well water noted that it is also dangerous to dig a well as the well wall could collapse on you while digging. Another problem is that over time the water table drops, and therefore one will need to dig deeper until they find water.

For those who have to collect water from other people, it looked very difficult. Based on observations, the soil was too thick and heavy for people to be pushing wheelbarrows with loaded containers. Some participants pointed out that it was unfair that some portions of the village cannot access water from the nearby pipes while those close to the pipelines can access water easily.

Even those who are accessing water connected to the public boreholes still face challenges. The particular problem is that the access to the water is on an interval basis to a point where it was mentioned that people collect enough to last them for a while because of the problem of intervals. A participant said that the interval supply starts at 11:00 am then stops pumping at 13:00 pm then begin at 14:00 pm until 18:00 when it ends until the cycle starts again tomorrow.

One of the participants who owns a borehole said that it costs people a lot of money to install boreholes and to pump water using electricity. A participant noted that even though he could afford the R 18 000 to install his borehole, many people in the village could not afford this.

4.5.5. Residents' relationship with the municipality around water

In an Eyewitness News online article, it was reported that the then South African president Jacob Zuma made a statement in his State of the Nation address in 2012 that the supply of water to Ngobi will not be disrupted again (Bateman, 2013). This came after a Ngobi resident wrote a letter that requested that the government do something about the lack of water access in their village. I discovered this information about the president's involvement after I had collected data from Ngobi, but none of the participants stated anything about the visit by the president and several government officials during the building of the reservoirs. As there seems to have been a disconnection between what the president promised and what was delivered, it is important to consider the relationship between the community and the municipality.

With all the challenges of water access, still, all of the interviewed participants said that they do not have any significant relationship with the municipality or their councillors. It was mentioned by one of the participants that the municipality will ask people to come to the meetings to talk about various issues like water and in the end, nothing fruitful will develop from this. Another participant said that

the time when the reservoirs were in the process of being built, there was so much promise and hope but after that nothing much has happened. The sense that I got from the participants regarding how they raise their water grievances were that of wait and hope for the best. One participant who depends on buying borehole water said that as their councillor is not helpful to their problems, the other problem in this regard that the community is faced with is the distance to go to the municipality offices in Mathibestad through Hammanskraal route to make complaints about water. As shown in the map in Figure 13, this means travelling a great distance of more than 60km via the Hammanskraal route as this is the route with public transport.

4.6. Local Water Institutions (MLM & CoT)

4.6.1. Introduction

This section on the local water institutions presents data on the roles of MLM and CoT in ensuring that there is water access in the Moretele region. The data sources for this section are interviews conducted with several officials from MLM and CoT together with related reports and observations. I will start by giving a general overview of the province's hydrological infrastructure on the North West to understand the position of MLM. I will then introduce the involved institutions and explain the relationship between the MLM and the CoT concerning water supply in the Moretele region. This will be followed by a description of the context of the MLM, which will explain the position of the municipality, history, relation to the villages and the province. There is also a detailed discussion of the role of the local municipality in making sure that they realise the 'right to water' access in the villages in their capacity as the WSA. The three modes of water supply that the local municipality supplies water to the communities, namely reticulated water into the yards of the residents, truck water system and refurbishment of boreholes, will be explained and discussed. Related to that there will be a discussion on the challenges linked to how water is supplied and how recipients access the water.

In the section, there will be a linking of the roles between the WSA in the form of the MLM and the WSP in the way of CoT. The discussion will further explain how the CoT supplies bulk water from its various capacities and the challenges that it experiences. In the end, there will be a discussion that will touch on what the future holds for the water situation in the Moretele region.

4.6.2. North West province hydrological infrastructure.

Water in the North West Province is obtained from ground and surface water sources (WRC, 2011). Surface water is generally non-perennial and takes into

account rivers, lakes and pans. Groundwater is still the primary source and is utilised for domestic, agriculture and mining purposes usually without being treated. In addition, there are several pollution effects (nitrates, organics, microbiological) that are found with groundwater. The raised levels of mineral materials are because of the natural geology of areas, but pollution could also be the reason (WRC, 2011).

The majority of the province's bulk water originates from the Vaal River system which means that water is transported from a distance through the use of high pumping elevation (North West Water Sector Forum, 2006). The North West province is found in the within the four Water Management Area (WMA), Lower Vaal, Middle Vaal, Upper Vaal and Crocodile Marico. Some of the major dams found in the province are Hartebeespoort, Klein Marico, Kromellenboog, Marico Bosveld and Molatedi (North West Water Sector Forum, 2006).

Of the four district municipalities in the North West, BDM is situated to the eastern, southern and northern side of the Crocodile (West) Marico WMA (North West Water Sector Forum, 2006). Moretele region, the focus of this research, is one of the five regions found in BDM. MLM is the only municipality that mainly gets its bulk water from treatment works which are outside the North West province in the form of the TWPP. This is situated in Hammanskraal in the north of Gauteng Province.

4.6.3. The relationship between the institutional water actors

To further understand the water access experience of the three villages I learned about the related water supply to the region by examining the roles of the WSA and the WSP. According to the Municipal Structures Act, the responsibility of a WSA is to make sure that there is access to water supply and sanitation services for areas within their jurisdiction. The WSP is responsible for physically supplying water sanitation services to consumers under contract with the WSA

(DWA, 2005). When I first approached MLM, I was informed that it is the WSA, so I then decided to solely focus on the local municipality instead of the district municipality. It was then further revealed that CoT is their WSP.

4.7. Moretele Local Municipality's role in supplying water to the Moretele region

According to the official from the local municipality, the job of the municipality is to make sure that all the villages in their region do get sufficient water supply. The municipality is also involved in carrying out the assessment and maintenance of the infrastructures in the area. In two of the three villages (Makapanstad and Carousel View), the municipality has already installed pipes, taps and water meters for people to access reticulated water. The amount of water that the municipality receives is dictated by how much water the WSP (in this case, CoT) can supply. Table 7 below illustrates volume and costs of bulk water supplied to MLM by CoT over a thirteen month period from June 2017- June 2018. In this regard, CoT supplies MLM with reticulated water on an interval basis. The municipality pays CoT based on water received rather than on the water required. Because of the restrictions on the water received, MLM has been forced to supply water in three different manners to its villages; reticulated water in the yards, water tanker service and boreholes system. I discuss the processes of each in turn.

Table 7: Volume and costs of bulk water supplied to the Moretele Local Municipality by the City of Tshwane Municipality (taken from information provided by a CoT official)

Month	Volume (Kilolitre)	Total Cost (Rand)
Jun-17	237 108	1 873 805.94
Jul-17	290 249	2 206 588.98
Aug-17	324 488	2 964 456.82
Sep-17	246 113	2 159 054.89
Oct-17	328 970	3 011 302.92
Nov-17	306 012	2 785 122.39
Dec-17	198 980	1 652 640.58
Jan-18	143 074	1 155 549.50
Feb-18	157 183	1 269 502.05
Mar-18	189 012	1 548 454.51
Apr-18	210 447	1 801 941.02
May-18	170 386	1 388 208.60
Jun-18	186 281	1 547 141.06

4.7.1. The manners in which the Moretele Local Municipality supplies water to the communities

4.7.1.1. The reticulated water into the yards of the residents

MLM pointed out in an interview that after there was a decrease in the standpipe usage, then reticulated water to the yards was a common manner of water supply until problems of capacity and maintenance emerged. There are some communities in the Moretele area that have reticulated water set up, with installed taps and meters in their yards as it was seen with Makapanstad and Carousel View. An official from the TWPP added to the words of MLM, saying that over the years the water supply through this form (reticulated water supply) has decreased to a point where the supply is carried on an interval basis, e.g. Thursday-Sunday, Friday-Monday (as reported in Makapanstad) because there is not enough water in the plant to have a continuous supply.

The other problem mentioned at the TWPP is that there is not enough water pressure to reach all the other places in the region because the plant does not have enough capacity for storage. It was brought to my attention at a later stage of the data collection that the reason areas like Makapanstad are not getting water is because of related problems such as capacity and distance. Carousel View, from the study, is the only village from the Moretele region that recently has a reasonable supply of water according to its residents and MLM.

4.7.1.2. Truck water system

According to an MLM official, the system of reticulated water into residents' yards was not consistent for various reasons, so the municipality and CoT agreed on a temporary solution of supplying water to some communities within the Moretele region through trucks until the TWPP is upgraded. About 30 trucks supply water to villages, providing water to around 12 communities, according to the IDP (MLM, 2017). These mostly supply the middle to the south of the Moretele region, since the northern part of the region has the borehole water supply system, like two that have been mentioned in the Ngobi (refurbished public boreholes and the Transactie Well Fields Water Supply). The water trucks line up outside the TWPP to collect water. A hydrant pours the water into the loaded tanks on top of the trucks (Figure 32), and they then travel to distribute the water to the various communities.



Figure 32: Lined-up water tankers, collecting water from a hydrant in outside TWPP.

Photo: Motshwaedi Sepeng (researcher)

4.7.1.3. Refurbishment of public boreholes

Since villages in the north of the municipality usually have a good quality of groundwater, they get their water mostly from the newly revamped public borehole system. The old public boreholes have been remodelled and electrically operated to pull groundwater and store it in the attached small tanks or reservoirs. Subsequently, people have dug trenches to connect pipes from these revamped public borehole structures into their homes to have a reticulated water system.

Based on the information from MLM's most recent IDP, another public borehole water supply in the northern region is through the borehole plant located in the Transactie Well Fields (MLM, 2017). This is said to be providing water to around 12 communities in that region. According to the report, MLM has full ownership of the fields, but MW operates them (MLM, 2017). I was told that once the water is extracted from the approximately 11 drilled wells, then it gets desalinated, stored and distributed to the various villages. The IDP notes that benefiting villages include Jumbo, Ngobi, Transactie, Slagboom, Mmukubyene,

Bollantlokwe, Lebotlwane, De Grens, Little, Thlokwe and Flink Zyn Drift (MLM, 2017, p.109).

4.7.2. Challenges faced in relationship between the municipality and the community

When it comes to how the community and the municipality communicate, I was told by a participant from Carousel View that they as the community have to inform their councillors of their grievances and if the councillors cannot resolve the issues, then the councillors will have to address these concerns to the municipality. The MLM also confirmed this. It was also pointed out by the MLM that some of the community members usually do not attend the meetings they organise for them to discuss the issues such as water service and other service delivery. This was also mentioned by some of the community members from Makapanstad with one saying that the meetings are a waste of time.

4.8. City of Tshwane role in supplying water to the Moretele region

An engineer from the CoT explained that their role as the WSP is to supply bulk water to MLM. There are various roles in different capacities which are played by CoT in supplying water. Firstly, there is a broader operation located in Pretoria that deals with the planning of the water infrastructure in various regions in Tshwane. There are seven regions under CoT, Hammanskraal falls under region 2 of CoT municipality. The second facility is the TWPP located in Kudube unit 2 in Hammanskraal adjacent to the M21 road.

The plant is where they deal first-hand with the day-to-day operations of the received raw water and the potable water that is delivered to the consumers. The bulk of the water of region 2 mainly comes from the CoT municipality's TWPP and some from MW through the KWTP.

Relating to the establishment of the new local municipalities in 2000, I was informed by an official from MLM that it was then that CoT became the WSP for MLM to provide bulk water service to the Moretele region. In 2000 in South Africa, there was a shift of municipalities into independent municipal status to achieve the mandate of ‘developmental local government’. This resulted in the decrease of 843 transitional municipalities to 284 municipalities. The 284 municipalities were further reduced to 283 by 2006 (Kanyane, 2014). The numbers of the municipalities has been reducing over the years; currently, in South Africa there is a total of 278 municipalities which are made of eight metropolitan, 44 district and 226 local municipalities (GCIS, 2017).

Below I detail the origins of CoT’s water supply, its circulation through a treatment plant, its subsequent distribution and then associated problems and challenges. I draw on my interviews with two of their officials from Pretoria and two from TWPP. The information is also drawn from the observations conducted during my visit at TWPP and also the review of relevant reports.

4.8.1. The origin of the received water

“Tshwane receives 81.3% of its water from Rand Water and MW. The City of Tshwane supplies the remaining 18.7% from its own dams, boreholes and springs” (CoT, n.d., p.1). As seen here, the CoT gets its water supply from a range of sources, but the water that is received by MLM through the TWPP is extracted (raw) from the Leeukraal Dam.

The dam is also known as the Kudube Dam (figure 33) and is an earth-fill type dam found on the Leeukraal farm. It is situated on the Apies River 50km north of Tshwane, Hammanskraal (DWAF, 2006). The dam has a height of 10.95 m above the riverbed level; with net storage of $5,388 \times 10^6 \text{m}^3$ and water surface of 37.55ha when is at a full supply level (DWAF, 2006). The Leeukraal dam outlet works has two 800 mm diameter pipes. The dam supplies raw water to the purification plant

and pump station situated downstream of the dam on the left side of flow to parts of the Temba and Babelegi urban areas (DWAF, 2006).

4.8.2. Water circulation

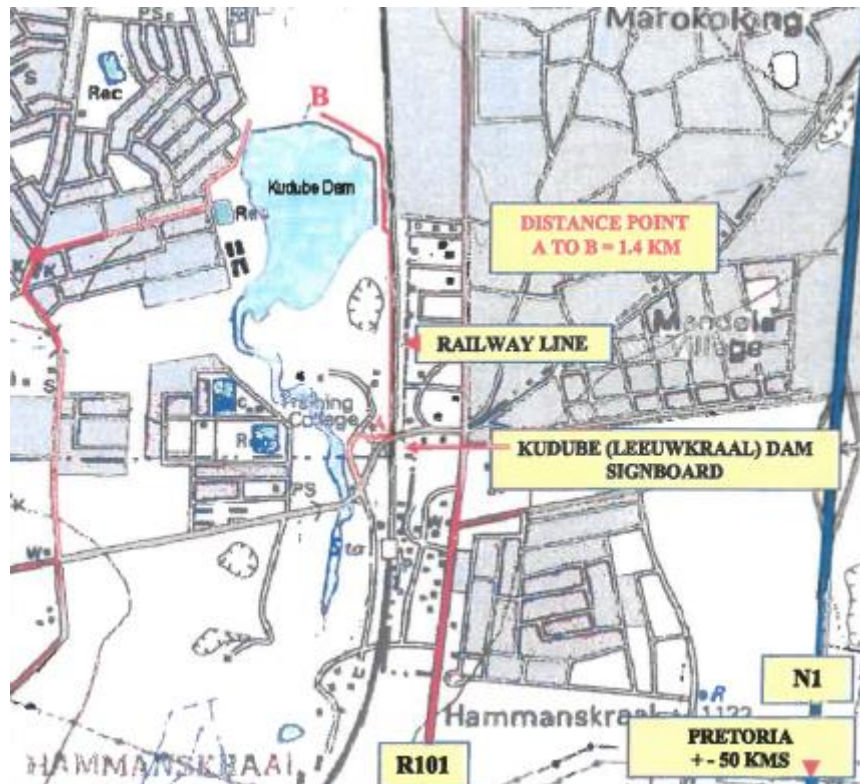


Figure 33: The location of the Leeukraal/Kudube Dam on a topographic map (B)
(DWAF, 2006)

4.8.3. The Temba Water Purification Plant

Raw water is extracted from the Leeukraal dam to be treated on-site at the TWPP (Van Rooyen 2017). According to officials from the plant, currently, 60Ml/d (Megalitre per day) is treated at the plant, and about 50 additional megalitres of that 60Ml get distributed daily. According to CoT, the plant is currently in the process of expansion (as seen in Figure 35 below) to increase the capacity to 120

Ml and a setup for 165 Ml/day will be made for the next phase of the upgrading project (Van Rooyen 2017). There are four working reservoirs, with the fifth reservoir still under construction, and two tower pumps (in-house) that are used to store the finally processed water (Figure 34). Each of these storages have different capacities with the reservoirs having more capacity than the tower pumps. From the four reservoirs that are inside the plant, I was told that one had been purchased by MLM to accommodate the Moretele region. Based on the information received from the officials at the plant, the capacity of three of the four reservoirs is as follows; 5.7Ml, 5Ml, and 2.5Ml (the capacity of the fourth reservoir was not known). The capacities of the two tower pumps are 0.7Ml and 0.5Ml. These are the current water storages that are functioning in the TWPP. In line with the expansion of the plant, there is a newly built reservoir for MLM at the top of figure 34 which was said to be completed by 2018 to increase the current capacity.



Figure 34: Aerial view of the TWPP in Kudube Hammanskraal.

(Google Maps, n.d.)



Figure 35: The expansion of the TWPP

Photo: Motshwaedi Sepeng (researcher)

4.8.4. Distribution of water

After the water is cleaned in the plant through the various stages (Figure 36), before the water can be distributed to its intended recipients, it is stored in the external reservoirs. There are currently five outside reservoirs with different capacities that are supposed to get water from the TWPP. The capacities of the reservoirs are as follows; Babelegi reservoir 9.8Ml; New Eersterust reservoir 5Ml; Sekampaneng reservoir 5Ml; Hammanskraal reservoir 6Ml and the Hammanskraal West 8Ml. The New Eersterust reservoir was not in operation due to maintenance being done; this was pointed out continuously by an official from CoT. One of the five external working reservoirs, the Babelegi reservoir, is currently getting its supply from both the TWPP and the KWTP. Carousel View receives its water from this Babelegi reservoir. Additionally, as noted by Van Rooyen (2017), the circulation system is distributed to the listed reservoirs in the listed intervals in Table 8, showing how water supply will increase in the future.

Table 8: Current, future and ultimate flow distribution from TWPP

Area	Current plant (Mℓ/day)	Future plant (Mℓ/day)	Ultimate (Mℓ/day)
Babelegi and Hammanskraal	15.5	26.2	30.2
Sekampaneng Reservoir	23.0	47.1	53.6
Local Temba Network	15.2	17.4	19.0
Hammanskraal West	3.7	32.9	37.8
TOTAL	57.4	123.6	140.6

(Van Rooyen, 2017)

CoT officials said that villages in the vicinity of the local municipality, such as Makapanstad, do not have an established and currently operating reservoir that stores water to be distributed to their different villages. Therefore, these areas get their water from the municipality in three alternative ways; through the household reticulation, the standpipes and the tanker services. I was told that there are pipes that are supposed to transmit water from the plant into the different villages in Moretele. According to MLM's IDP, the three pipelines from the TWPP are the east bank, west bank and the western area (MLM, 2017). The water through these pipelines has to be stored in the following storages: Babelegi Reservoir – 9.8Ml and Babelegi Tower Reservoir – 0.25Ml (east bank); Opperman Reservoir – 0.42Ml; Makapanstad Reservoir – 2.0Ml and Makapanstad Tower Reservoir – 0.42Ml (west bank) and lastly New Eerste Rus Reservoir – 5Ml (MLM, 2017). As mentioned before some of the reservoirs are not working like the Makapanstad reservoirs while some like the Babelegi Reservoir are working which support Carousel View with water.

The current operation and distribution of the water from the TWPP to the west bank of the Moretele region is on a ratio of 14 Ml/d per 24 hours on the selected days. 14 Ml of water is the maximum amount of water that the TWPP can allocate to MLM at present, and this is not sufficient. Based on table 8, the Local Temba

network currently receives 15.2 Ml/d from the TWPP and has a population three times less than that of Moretele region. Therefore, water is supplied on an interval basis to the villages in this region (e.g. Thursday-Sunday, Friday-Monday). In relation to the limited supply of water in this region, I was told that there is not enough water that is produced by the plant to be able to ensure that the villages in the Moretele region get sufficient water. Building to that reason, it was further explained that for constant water supply in the region, the pipes carrying water need always to be filled with water to ensure that there is enough pressure to reach the people's taps.

Since the reticulated water system is not able to ensure that people get sufficient water, it was decided that additional water needed to be transported to the people through trucks from the Temba plant. The water trucks line-up outside the TWPP to collect water from a hydrant situated outside the plant. After the collection of the water, then trucks distribute the water to the various villages in need. At the TWPP I was told that the daily collected water by the trucks from the plant is about 500,000 litres per day to be distributed to the various villages around Hammanskraal and the Moretele region.

4.8.5. Problems related to the Temba water source

A Tshwane official stated that the structure of the plant needs to be upgraded to deal with the quality of the water they extract from the water source. This upgraded quality of the water in the plant will filter in together with the expansion of the TWPP. As the plant is being improved, it will also include technology that will deal better with the raw water from the source. During my visit to the plant, I was told that the expansion project was said to be finished by 2018, but because of many holdups, the job is behind schedule.

During my data collection from Makapanstad, it was mentioned by some participants that the water they access from the plant is not clean. In one of the

online articles, it was explained that there was a time when residents around Hammanskraal protested against the poor quality of the water they receive from the plant, stating that the water that comes from their taps is of bad quality and has bacteria in it (Abreu, 2015). In *The Citizen*, it was reported that the Rooiwal Waste Water Works has not been in operation for months leading some of its pollution to enter the Apies River (Kgosana, 2018). The ‘City of Tshwane: Draft Water Scarcity Report’ further added that the source water that enters the TWPP is ‘problematic’ as a result of the pollution getting into the Leeukraal Dam (CoT, n.d). Problem parameters include: “colour, turbidity total organic carbon, aluminium, iron, lead, manganese, zinc, ammonia, nitrite and all the microbiological parameters such as E.coli, heterotrophic plate count and total coliforms (CoT,n.d, p.15). According to the same report, the Leeukraal Dam is eutrophic. “Tests in the raw water indicate that EDCs are a concern” (CoT,n.d, p.15). During the second interview with the CoT municipality, an official explained that over the years the level of pollution has increased in the river that feeds water into the dam. The point he was making was that when the TWPP was established, it was not planned to accommodate the current levels of pollution. In my visit to the TWPP, it was explained to me that the received water is very dirty. Therefore at the plant, the water is treated mainly for PH, dissolved solids, smell, taste and colour before it could be potable for drinking.

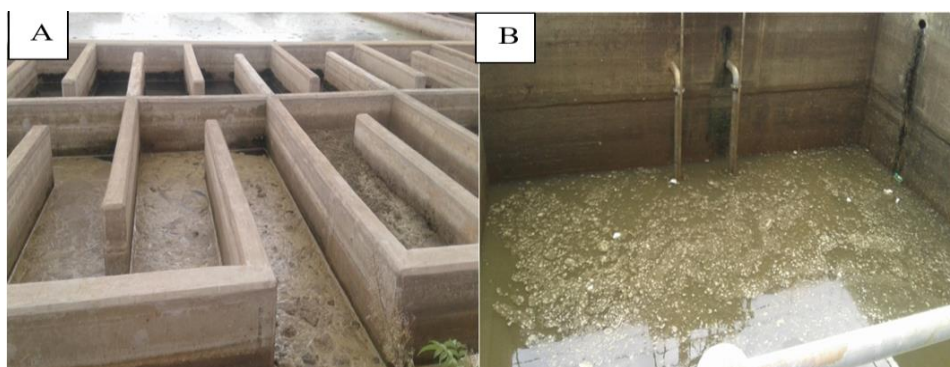


Figure 36: Released separated waste sludge water from the TWPP (A&B)

Photo: Motshwaedi Sepeng (researcher)

4.8.6. Associated challenges

It was pointed out at the TWPP that there were protests that happened around the time when the plant was about to be upgraded and expanded. The protest has been reported in Abreu and Hlahla (2013) that residents protested outside the premises of the then-called MW treatment plant expressing their displeasure around how the job selection was handled to hire people for the project. The upgrading that needed to be done had to be put on hold.

4.9. Future of the water supply plans

There is an added amount of responsibility that CoT is facing with additionally supplying water to the MLM while also trying to provide potable water to villages in their jurisdiction. Though currently, CoT is supplying water to MLM, however in the future the plan is for MW to take over the water supply into the Moretele region (Magalies Water, 2017). The problem is that MW at the moment also does not have enough storage. In an interview with CoT I was told that the MW's KWTP is currently being expanded. KWTP currently supplies a portion of their water to the Babelegi reservoir through the east bank which also provides water to the village of Carousel View.

In Figure 37, we can see in the new proposed plan that MW, through their planned pipeline, will move through the Babelegi plant and cross the R101 road to get to the Temba plant. This water is intended to supply the Moretele region (Magalies Water, 2017). The planned new bulk pipeline from the KWTP in phase 2 of the Moretele South Bulk Water Supply Schemes (BWSS) will assist MW to supply water to areas such as Carousel View, Bosplaas, Mogogelo and far western systems of the Moretele region (Magalies Water, 2017). In Phase 3 of the Moretele BWSS, the pipeline would enable water supply to the CoT-owned Babelegi reservoir and the proposed new 25 Ml Moretele Reservoir as seen in Figure 38 (Magalies Water, 2017). All these planned developments are set to

improve water supply from the WSP (CoT or maybe MW) to WSA (MLM) and improve infrastructure to deal with water quality.

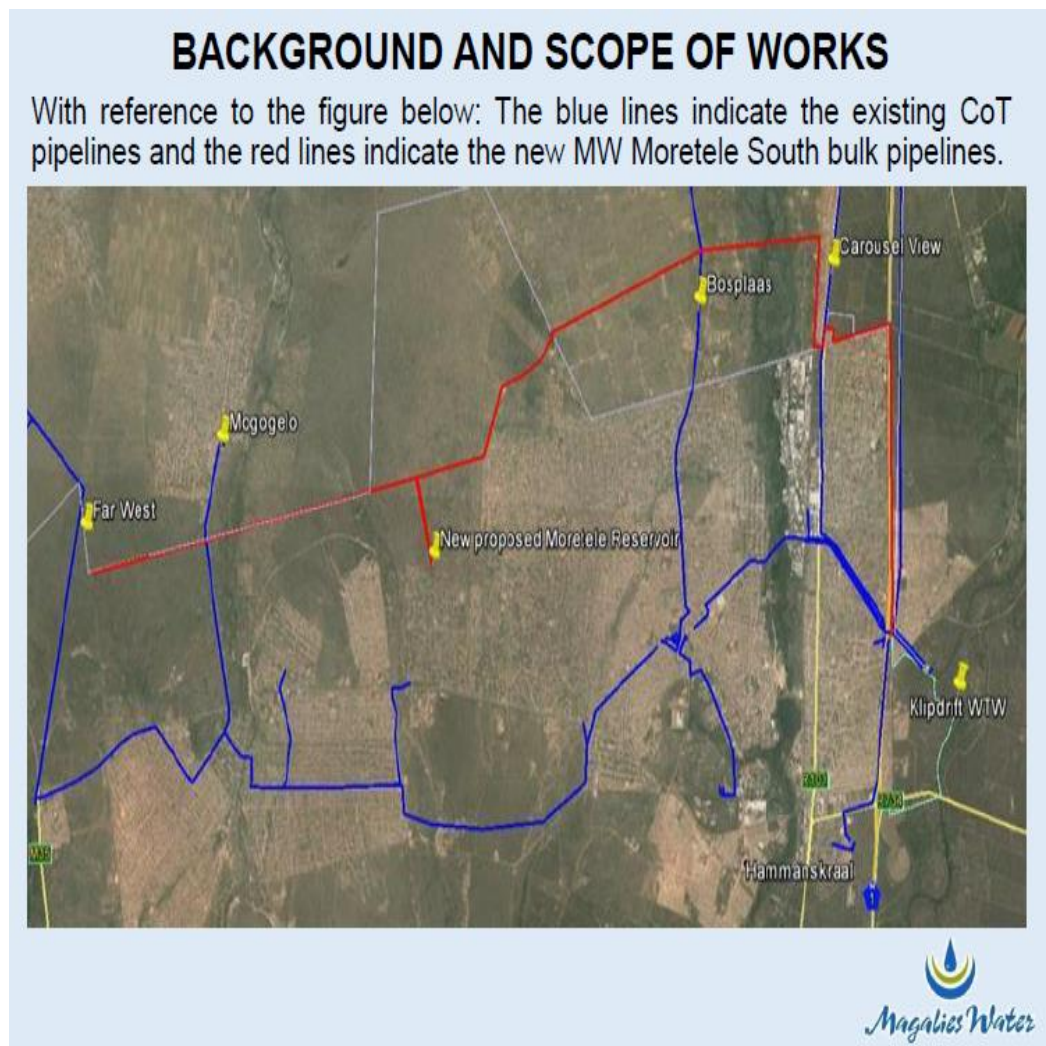


Figure 37: A proposed scope of the water supply by the MW to the Moretele region
(Magalies Water, 2017)

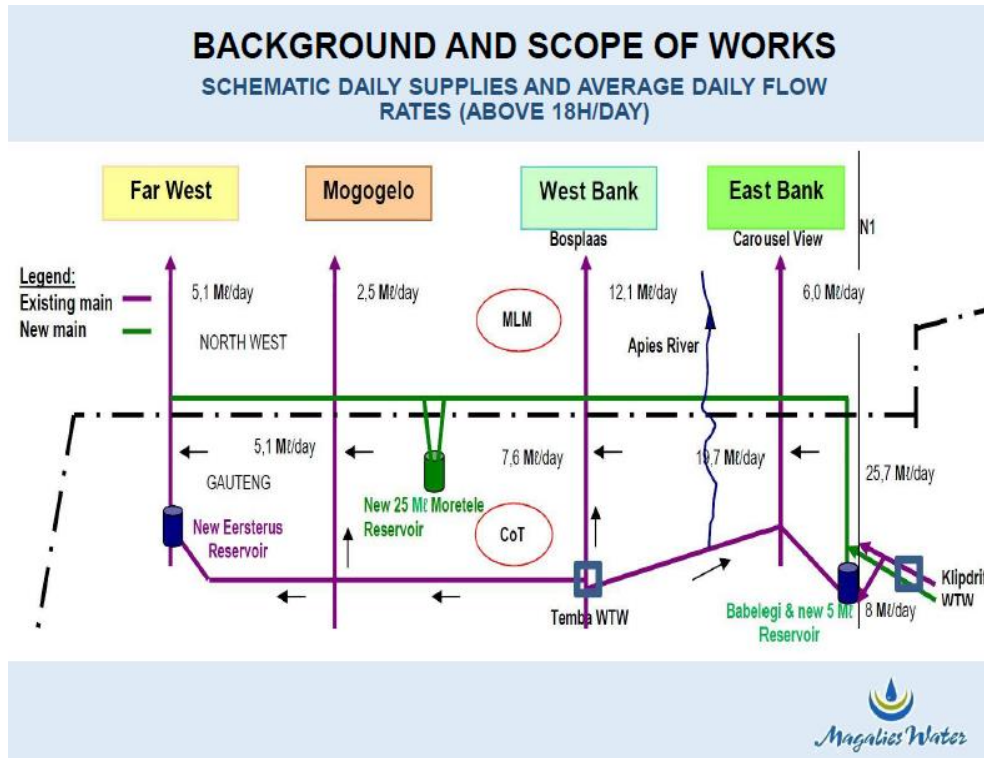


Figure 38: A proposed scope of the water supply by the MW to the Moretele region
(Magalies Water, 2017)

4.10. Conclusion

In light of understanding the dynamics that shape water access in the region of Moretele, this chapter has worked to provide the perspective for that. The result section takes us through the journey of understanding how water access is occurring in the Moretele region over time. There was first an in-depth breakdown of how Makapanstad, Carousel View and Ngobi have been accessing water over the years. The results show there are three main modes of water access in the region of Moretele namely reticulated treated water access, borehole water access and rainwater access. Reticulated treated water is accessed in associated villages such as Makapanstad and Carousel View. Borehole water access has been and still is the most common water mode especially currently in the Makapanstad and Ngobi. Rainwater is used as a supplementary water mode by villagers in Moretele depending on its availability from the rainfall. All the water modes in the region

have lingering challenges that support the argument that there is not reliable potable water access Moretele.

The verdict from the related institution is that they are doing whatever possible to make sure that in the end, the people of Moretele have access to water. MLM and CoT are both the WSA and WSP respectively and have both struggled to ensure that they fully realise the right to water access to the communities in the Moretele region. The biggest obstacle is that the water developments that both these institutions have been involved in have taken time to bear fruit. It has been over 20 years since democracy in South Africa and the TWPP is still not producing sufficient water supply to accommodate the Moretele region and the water delivered on an interval basis. On the other hand, the borehole setups in the north of the region are also not accommodating everyone as it was the case in the village of Ngobi. All these challenges have forced the majority of the people in the villages where there is no consistent water supply to rely upon individual boreholes for water supply, wells in some cases or just collecting water from other people. A glimmer of hope has been the upgrade of both the TWPP and KWTP which are set to ensure that the water capacity will increase from 60ML/d to 120ML/d as MW is set to take over the duties of WSP from CoT. The doubling in capacity could mean that there will be sufficient water to fill the reservoirs and this is expected to reduce the probability of water interruptions. When I visited the TWPP in 2017 I was told that the timeline for the completion of the upgrade should be by early 2018. But as my data collection continued until 2018, the TWPP plant was still being upgraded as seen in Figure 35.

Chapter 5: Discussion

5.1. Introduction

Chapter 5 interprets the meaning of the accumulated and presented results in this research (Hess, 2004). In the first part of the chapter, there will be a comparative look at the different case studies presented in this research, highlighting similarities, differences and how the key findings from the case studies talk to each other. The second part of the discussion will evaluate the results in relation to the core literature. This will start by examining what has led to the dependence on groundwater and other poor water sources. This will then be followed by examining the challenges of water administration and how that compares with the reported water situation in the Moretele region. Lastly, in the second part of the discussion, I take a closer look at related institutional agencies and how they have fared in ensuring water access. The third and last part of the discussion considers what the collected data has meant to the overall project and ends with an analytical reflection.

5.2. Interpreting comparative findings across the three village sites

This discussion presents a comparative analysis looking at the historical differences and similarities of the villages involved in the study, as well as the characteristics of the villages regarding size and proximity. With this context, we get into the comparative story of water access modes and key themes across the cases. As the municipality administers the villages, we will hear about the different relationships that the villages have with the local municipality. This first part of the discussion ends with looking at how the villages share the burden of water infrastructures not serving them efficiently with potable water.

5.2.1. General contextual similarities and differences

MLM administers all the villages in the region; therefore, there are some parallel characteristics that the villages share. MLM is a rural municipality; therefore, many of the villages in the region have characteristics that resemble a rural setting. On the other hand, the villages are different based on their position and history; all the villages have various aspects that set them apart from one another. For one, some people in Carousel View were first in Bosplaas village and other different places before they moved to Carousel View, while the people of Makapanstad and Ngobi have mostly been staying in their villages for many years. Carousel View is also a peri-urban location that is made up of RDP houses when compared to Ngobi and Makapanstad which are more rural types of settlements with large yards and irregular street patterns. When it comes to proximity to the local municipality, both Makapanstad and Carousel View are closer to MLM offices situated in the village of Mathibestad. This proximity to the municipality should make it easier for interaction with the municipality. The village of Ngobi in comparison is further away, just like the other villages from the north of the region, at about 35.5 km north of the municipality.

There are also differences in population sizes and densities of the villages as well as the level of development of the villages. Of the three villages, Makapanstad is the biggest in terms of its area and population size. The population density of Carousel View mirrors that of an urban area with a higher population density of 4150.60 people per km². The population density for Makapanstad is 737.21 people per square kilometre while on the other hand the population density of Ngobi sits at 226.00 people per square kilometre, the lowest of the three villages. Carousel View has just an area of 1.68km² but has a population size of 6,973 that is more than double the population size of Ngobi (3,494) that has an area of 15.46km². As such, around Ngobi, one finds many homes that have vast tracts of land that are used for farming on top of dwelling and this is very different from a village like Carousel View which resembles a model of a township, consisting of RDP houses with grid streets. Carousel View is on the periphery of productive

settings, that makes it a more attractive location for people than the other two villages - the Babelegi Industrial Park, Carousel Hotel and proximity to the small town of Hammanskraal. Makapanstad shares some of the qualities of both Ngobi and Carousel View. It is rural in the sense that it does not have grid streets with tar roads like Carousel View, but unlike Ngobi, it has smaller yards that are used for dwelling and subsistence arable farming while Ngobi has incidents of yards also accommodating livestock (mixed farming).

Finally, there is some difference in terms of poverty levels, with Makapanstad showing the lower poverty rates. In Makapanstad, 25.7% of the population have an average household income of less than R9 600, with up to 16.7% reporting no income. In Carousel View, this rose to 36% of the population have an average household income of less than R9 600, with up to 18.8% reporting no income. In Ngobi, 21.2% of the population (21.2%) reported no income (Statistics South Africa, n.d), with up to 33.3% who earn less than R9 600/month.

5.2.2. Water access similarities and differences

Having outlined the contextual differences between the villages, we can assess the difference and similarities of how water is accessed and supplied in the region. First, however, it is essential to look at what the statistical information says about water access in the Moretele region based on reports of Stats SA. According to figures from the Stats SA data census of 2011, there was not significant differences between the villages; with the percentage of piped water inside dwellings for all the three villages sitting below 5% (Statistics South Africa, n.d). This is slightly lower when compared to the already low overall percentage of the whole municipality (8.7%). Apparently 4.7% of Makapanstad households have piped water inside dwellings which is slightly higher than peri-urban Carousel View with 4.1%. This was surprising as most of the homes I visited in Carousel View not only had taps in the yards but also had water unlike Makapanstad. In Ngobi, the percentage is at a low of 3.8% households. This is a sign that the municipal

water access in all three villages is a problem. This is also the reason why the percentage of households with flush toilets connected to sewerage is very low in all the villages, and around the whole region. Again, it is surprising that Makapanstad which struggles with water access, more than a place like Carousel View, would have 1.7% of households with flush toilets connected to sewerage compared to Carousel View's 0.9% (Statistics South Africa, n.d). It looks as if the municipality's development plans of RDP houses came with the awareness that water is a problem in this area as the new RDP houses came with pit toilets. Just as the policy of GEAR stipulated in the 1990s (with the help from institutions such as the World Bank), the realisation was that the poor people cannot pay for services at free market rates (Schneider, 2003). Then according to Bond (1997), "Since poor people often can't pay—at free market rates—the Bank's solution was to deny people access to water-borne sanitation and give them pit latrines instead" (in Schneider, 2003, p. 44).

Relating to the above statistics, my results show how water is accessed on the ground regarding the general modes of water access between the villages. In Makapanstad, while people rely on different modes of access, most residents obtain water mainly from boreholes, with people commonly buying this borehole water from other residents. In Ngobi, it was a bit more complicated to see what exactly the general source of water was because in different sections in the village participants expressed using a variety of sources. However, five out of 15 said they currently depended on access from the refurbished public boreholes through self-connections while the other half bought their water from people with boreholes (5/15). What is worth noting is that of the five people who bought borehole water two of them also used wells as additional sources. In Carousel View, it was pretty clear that people currently depend on reticulated water from the government, even though there is an erratic supply.

The following sections thoroughly analyse each of these three primary water sources, starting start with municipal water, then groundwater and lastly

rainwater. These are combined differently in each of the case villages, shaped contextually by a range of interacting factors: local hydrological and geomorphological factors; distance from the bulk water infrastructure; the kinds of housing available and settlement forms; peoples' strategies and practices in meeting their needs; differentiated poverty levels, and relationships with the restructuring local state, development projects and policy.

5.2.3. Municipal water as preferable but undependable

Even though the municipal treated water access in the Moretele region is on an interval basis, we can also note that this service is not inclusively available to everyone. Makapanstad and Carousel View were the two villages that indicated the use of municipal water. Carousel View has this in the form of reticulated water in the yards while in Makapanstad, in addition to reticulated water in the yards, they also access municipal water through the tanker service. The MLM has said that because places like Makapanstad have a poor quality of groundwater, this is the reason why they are provided with the municipal water. Carousel View currently has a reasonable municipal water supply unless there are water interruptions then the people will have to go and collect water from the standpipe in front of Carousel Hotel or ask for water from the houses in Ramotse village. Based on the response from the MLM, Carousel View has reasonable municipal water supply is because of its proximity to an established Babelegi reservoir. Of the three selected villages in the Moretele region, people in Ngobi did not mention any dependence on municipal water. The northern villages get groundwater from the government through refurbished boreholes and the Transactie well fields as a result of having good quality groundwater.

When the government talks about their role in supplying water to the citizens, municipal piped water is the predominant notion of how this will be fulfilled in urban areas, and groundwater more common in rural areas. This makes for multiple experiences and expectations in a peri-urban and rural local municipality

like Moretele. This research has established that groundwater has and is still the most common source of water supply in the region. This is not forgetting the supply of rainwater which is limited seasonally. As we continue to discuss the differences and similarities other water sources are further elaborated in relation to their dependence.

5.2.4. Commonality in groundwater use

It is quite evident that through history, all the villages have accessed groundwater in one way or another. In the cases of Makapanstad and Ngobi, groundwater has and is still depended on as the primary source of water, in different forms. Most of the modes of accessing groundwater highlighted in the research ranged from individual boreholes to public standpipes from boreholes. In Carousel View, groundwater used to be quite common in the 1990s when people were staying in Bosplaas or when they arrived in Carousel View. However, from what was observed in Carousel View, going to collect water in Bosplaas seemed to be a challenge because of crossing the railway line. The dependence on groundwater in the village had declined with the launch of municipal public standpipes (treated water) around 2005/6. In Carousel View none of the participants mentioned the use and ownership of boreholes currently and on close observation, there were no signs of borehole water being a mode of water access. In the 1990s, wells were more prevalent in Ngobi but some people still access water from wells to this day, enabled by the particularly sandy soils of the area.

The importance of groundwater in the villages without the consistent supply of municipality-treated water is boldly highlighted in both Makapanstad and Ngobi communities; who up to now have been accessing borehole water. The only difference is that the Makapanstad residents do not access water from a set-up like the Transactie reservoirs plant. The reason for this was explained by MLM who said that the quality of the groundwater in Makapanstad is substandard, due to

high levels of sodium in the water, and that is why currently there are no municipality-supported groundwater initiatives.

Participants in all villages mentioned having collected water from outside their houses at some stage in their lives. Both the municipal water and groundwater (boreholes) also have the characteristics of being collected outside the homes of the people. The collecting of water from other households is an inclusive practice that has been practised in the past and present in the region, and it is prevalent where borehole water access is the primary source of water.

5.2.5. Rain water as supplementary source in some villages

Even though rainfall is an unpredictable source of water, there was an indication that some villages were depending on rainwater, but more prevalently in Makapanstad than in the other villages. Even though there were people in Carousel View who said that they used rainwater, there were few houses with drums outside the homes for rainwater harvesting. In the case of Ngobi some people mentioned the use of rainwater even though they did not talk much about it.

5.2.6. Differentiated relationships with the municipality

Participants from the three villages shared similar sentiments about the relationships they have with the MLM regarding interaction and trust concerning water service delivery. The municipality and some participants agreed that there are meetings which are planned by MLM to communicate with the communities and use that as a tool to get their message across to the people. In the case of Makapanstad, a participant said that people do not like to go to the municipality meetings as they do not see value in the meetings. The feeling is that the municipality does not inform them of important things they need to know. People from both the Makapanstad and Carousel View mentioned that the municipality

was not informing them about the days when the water interruptions will happen so that they could be prepared. There were community members from Makapanstad who said that even though they know the days when the water trucks would be coming, there were days when the water trucks would not arrive without their knowledge. However, in the case of Ngobi, people have been notified about the water intervals, and this gives the people time to store enough water until the next time when water will be opened again.

It was mentioned that the reason the service delivery protests occurred in Carousel View was that the people felt that the water interruptions have been going on for a while. A similar story was highlighted by some people from Makapanstad who said that the issue of water service delivery has been unsatisfactory in their village for quite some time which is the reason that people protested. The other reason for the protests was that residents felt that developments were going backward to a point where the water service was now through trucks. It looks like even though the people from both the villages were dissatisfied with the service, the absence of the municipality in communicating about developments and other water-related factors added to the frustration. The municipality then said that usually, councillors are the link between them and the community in facilitating things.

5.2.7. Lengthy developments to achieve water access

In an interview, CoT pointed that during apartheid the TWPP was used to cater for the surrounding townships like Temba and the suburban white areas like Rens Town while the rural areas were subject to accessing water through boreholes. At the dawn of democracy, there were many infrastructural adjustments that needed to be done to improve service to rural areas. Political ecologists Loftus (2009) and Smith (2002) remind us that these infrastructural backlogs have deep historical roots and have become the foundation shaping the water supply and distributions challenges of democratic South Africa. It is not clear why the TWPP plant is only

being expanded now. One explanation is that the water demand was not expected to be as high as it is currently.

However, we need to understand that there are broader processes shaping water service delivery. Such influences include government water policies, financial stability of the municipality and municipal restructuring. The inception of the current democratic municipality was only around 2000; the water affiliation between MLM and CoT began at that time. Various guidelines of the Municipal System Act of 2000 dictates the relationship between these two organisations as WSA and WSP.

Before the current manner of water access, the process of getting access to treated water in Makapanstad began through standpipes around the late 1990s - the time when the Water Act was drafted. The Act was followed by the implementation of policies such as FBW policy while some of the practical application of the Act only occurred in the 2000s. Relative to what was found from the study, in Makapanstad, households began to self-connect from the public boreholes into their yards around 2005. The local municipality then halted the flow of water as a result of self-connections; subsequently, the municipality installed their taps with meters. Coincidentally it was also the time when the village of Carousel View begun to have access to household water. It must not be forgotten that Carousel View's first taste of municipally-treated water came in the form of standpipes just before 2005. It is not clear when the refurbishment of public boreholes happened in Ngobi, but participants indicated this to have started around 2006. Based on these views from all three villages it looks as if the first significant developments to bring water into the yards of the people started around 2006. Progress has slowly been making its way in the villages through the building of water infrastructures, work which is still very much underway. This is especially in the case of Ngobi and Makapanstad where they face challenges of water interruptions, salty groundwater and borehole expense. In the meantime, people are supplementing erratic water supply through multiple strategies.

5.2.8. Water infrastructure not fully serving the people

Another argument could be made that the problem of water in the region is less to do with the availability of secondary infrastructures than the authorities making sure that there is consistent water supply. Wright-Contreras (2018) said that the will for infrastructure rests on a network of interconnected actors with various interests. Based on the information received from CoT and MLM officials, all the villages in the study have water structures on the ground to store water. Makapanstad has a reservoir, but according to the CoT, it is not functioning because there is not enough water capacity at the TWPP to be channelled to such reservoirs. In the case of Ngobi and the other northern villages the Transactie water plant supposedly supplies these villages with water, but it could not be established whether it is functional. Carousel View does not have water infrastructure that solely accommodates them, but the water that gets supplied into the village comes from the Babelegi reservoir. The point to be made is that even though the three villages suffer a similar fate of insufficient municipal water, generally all have secondary water structures. The MLM and CoT have acknowledged the problem for Makapanstad and Carousel View; water storage reservoirs are available but the TWPP is currently not processing enough water to fill them.

While Bela Bela is the closest town to Ngobi (35.2km north east from Ngobi), the MLM and two treatment plants are south (35 and 62 kms respectively). The local municipality has indicated that the practical water supply for the north is groundwater. Yet this research has shown that the existing municipality groundwater systems through the Transactie plant and the refurbished public pumps supply is not sufficient.

Additionally, Bela Bela is already getting its water from KWTP, and since the KWTP is also expanded just like TWPP, it might mean that the northern villages

in the Moretele region might get water through this. Makapanstad and Carousel View, on the other hand, are closer to Hammanskraal which will mean that they will benefit from the planned Magalies Water Bulk Water Supply System. At the moment the two villages have networks that are linked to the TWPP. CoT said that once the expansion at the TWPP and KWTP are completed then areas around the middle and south of the Moretele region will get enough water from the proposed cross-border Magalies bulk water supply system. These are Moretele areas that will be accessing water through the west bank and west bank pipelines.

5.2.9. Beyond supply: quality of the potable water accessed

There were mixed reports of water quality in all three villages. The challenges and advantages varied across locations and type of sources. The people of Carousel View did not complain about the quality of municipal water they access, nor the quality of the borehole water they accessed in the past. In Ngobi groundwater is a common water source in the village, and none of the participants complained about the quality of water whether being through wells or boreholes. The groundwater in Ngobi tastes better than that of Makapanstad.

People of Makapanstad complained about the quality of the municipal water they receive from the plant saying that it is dirty. It was mentioned that the water is dirty. Those who are accessing groundwater in the form of borehole water also lamented that the water was too salty.

CoT acknowledged the poor quality of municipal water at times; this was highlighted as one of the challenges they were facing, but they hope that the new developments at the plants will solve that problem. The municipality has also recognised that the quality of groundwater in the village is poor. However, they are caught between a rock and a hard place as they know that the water capacity from the TWPP is not enough to adequately supply areas like Makapanstad with water, and on the other side they know of the bad quality of the groundwater in those regions.

5.3. Relating the comparative findings to the literature

Having talked across the data from the three sites in the first part of the discussion, the second part of the discussion presents integration between results and related scholarly work conducted elsewhere. Considering the aims and objectives of the research, what does this integrated discussion say about the water situation in the Moretele region? I first reflect on how Moretele residents ended up depending on the use of groundwater and rainwater in the absence of municipality treated water. I then discuss what challenges of service delivery mentioned in the literature also surfaces in the Moretele region regarding water service delivery. I look at the roles of government structures, and how they distribute and manage the resources. I also consider how these institutions have performed according to the set policy guidelines. Concerning one of the objectives of water networks in the Moretele region, I analyse how past, present and future operations and occupation of the water networks have performed in supplying people with water.

5.4. The dependence on groundwater and other unimproved water sources forms is not by choice

The case study of Mothetha et al. (2013) has taught us that when people in rural areas are not getting water from the government, they turn to groundwater as it is easily accessible. Groundwater is a resource that people have used for generations. Long before democracy in South Africa, people were not provided with municipal treated water and they used groundwater. Groundwater is not bad in all contexts and can be an alternative water supply if the quality of water is acceptable. Ngobi presents a perfect argument that the problem is not really about the quality of the water, but the problem is with proper implementation of the borehole water projects to include everyone. Boreholes are also an upgrade of some sort; to move away from the other unprotected sources such as wells and river water. Even though some people owned boreholes in their yards, most of the interviewed people collected this borehole water by leaving their yards. This was done either

through collecting or buying the water from their neighbours. However, in Moretele and other rural areas in South Africa, the importance of groundwater sometimes is beyond the health standards, but it is more to do with the fact that treated municipal water is lacking. In Makapanstad people were still using groundwater in the form of boreholes even though it was deemed to be of poor quality by the municipality.

Ngobi is one case where it seems there is no need for municipal treated water. The only problem is that the set-up from the municipality to supply people with water from the Transactie plant and the refurbished public pumps are inadequate and inclusive to everyone. Firstly, the big Transactie plant that was said to be there to provide the people in the north of the region with water, none of the interviewed participants from the Ngobi village reported accessing water from the plant. Secondly, the refurbished public pumps are a good idea, but the problem is that they are few and far between therefore their access is restricted only to people close to them. Additionally, the supply from these refurbished public pumps is on an interval basis. Other than the community members being allowed to self-connect from the refurbished public pumps into their yards, the other positive aspect that participants praised was the consistency of the supply from these pumps. The hope is that more and more of these refurbished public setups will be introduced so that more and more people can have access to water.

Having argued the relevance of groundwater in some rural areas, other sources which were found to have been used in the study were wells and river water. Usually, these sources were used a long time ago, but in the case of Ngobi, some people were still using wells as alternative sources. The reason that was given by those individuals for using these sources was that they were not getting water from both the Transactie plant and the refurbished public pumps. One of the participants said, digging wells is very dangerous as the wall could collapse on someone. This was not the best way of people accessing water as it put a strain on their bodies plus also the amount of water collected from the wells is not enough.

There were people from Makapanstad and Carousel View who mentioned accessing water straight from the Tshwane Rivers. They alluded to the practice being conducted a long time ago and not at present but should there be a drought like the one that hit South Africa in 2015 and the continuous struggle by the municipality to provide water; then desperate people might be forced to access water from these sources again. It should not be necessary to go the route of Kwa Zulu Natal which experienced the cholera outbreak in 2000 when people were forced to access water from the contaminated Umfolozi River streams (Hemson and Dube, 2004). It was alleged that the reason that led to people accessing water from the polluted river was a result of the installation of pre-paid metered standpipes. This does mean that we cannot ignore the fact that if people do not find the appropriate model of water supply, then they can quickly revert to what they previously used.

5.5. Challenges hindering service delivery

A big responsibility has been placed on municipalities as WSAs to make sure that water service delivery is achieved. There have been few signs of accountability from the institutions administering water in the region of Moretele. Mdlongwa (2014) assess the causes of poor service delivery in the last 20 years in South Africa, and highlight some of the key challenges that hamper local government in delivering services. These challenges included human resource challenges, "corruption, maladministration, financial challenges, lack of awareness and lack of knowledge by communities with regards to their rights and slow rollout of services" (Mdlongwa, 2014, p. 39). Only the last three challenges were observed in this study, and this shows a lack of accountability. Thus this section begins by addressing accountability, public participation and access to information, the need for capital for the water developments and historic underinvestment in the water infrastructure. In doing so, I will consider the broader and more fundamental institutional factors shaping the dynamics of water access in the Moretele region, as per a political ecology approach.

5.5.1. Accountability is key in ensuring water access

The last two challenges mentioned by Mdlongwa (2014, p. 39) of ‘lack of knowledge by communities with regards to their rights and slow rollout of services’ were evident through the course of this study of the Moretele region. In the village of Ngobi, people did not seem worried about water access as a problem that needed to be addressed by the municipality. When asking the participants what actions they had taken to ensure that water access was improved, all except one participant said nothing. That is worrying because people need to understand their rights as a basis for taking action. Ironically it was from the very same village that a resident wrote a letter informing the then-president (Jacob Zuma) about the slow water progress in their area. The feeling was that this place was very isolated as it is very far from the local municipality which might have made it a bit difficult should the community require to make their feelings known to the municipality. In a way lack of holding the municipality accountable could also be a build-up to a dynamic that shapes the urgency in which the municipality reacts to distributing water supply.

Vis-à-vis the last challenge highlighted in the study of Mdlongwa (2014) around the ‘Slow rollout of services’, it is said that when the municipalities provide service to the communities, the process turns out to be slow, which compromises the quality of the service provided. The villagers in both Makapanstad and Carousel View felt that the way to get the attention of the municipality around water issues was through protesting in addressing the ‘slow rollout of services’. In chapter 4, a resident from Carousel View said that the reason that they were protesting was that in their village there had been extended water interruptions which affected their reticulated water supply. In Makapanstad the community protested precisely addressing slow developmental progress.

This was not to say that the approach taken by the communities of Carousel View and Makapanstad to hold the municipality accountable was best. The point is that

there is a need to have active channels in which the community and the municipality can adequately engage in addressing the water problems.

The notion of ‘service delivery’ has been associated with protests to a point where protest has been added to the words ‘service delivery’. The popularity of the term ‘service delivery protest’ has therefore been used loosely in the media as a definition of different types of protests (Chen et al., 2014). People cannot be blamed for thinking that protesting is the practical way of getting the attention of the municipality, because it was reported by some participants from both Makapanstad and Carousel View that in some instances water was restored after the protests. It is fundamental that the government effectively addresses this issue of ensuring an appropriate and efficient manner to address their grievances, or they will resort to protest. The violent demonstrations as seen in this study have resulted in infrastructure being damaged which feels like a one step forward and two steps back approach as those infrastructures will eventually need to be fixed to enable water supply.

5.5.2. Public Participation and access to information

There seems to be a lack of effective ways of communicating about service delivery problems and a need to a strengthening communication through participation. The best case of sustainable cooperative and participatory natural resource management institutions have undoubtedly contributed to the growing urgency for the government to embrace and institutionalise participatory governance of natural resources (Brown, 2011). It is not clear whether the poor relationship between the municipality and the community is the result of the lack of eagerness from the community to participate or whether it is because of the municipality is failing to encourage community engagement. What is clear is that public participation in municipal planning and programmes is still a challenge, even though this is a legal requirement and not a privilege (Beyers, 2016). MLM made it clear that the councillors were the link between them and the community.

This raised questions for future research around the role of councillors and integrated participatory forums.

Having access to information and the involvement in decision-making concerning water and health is needed, among other things, to enhance the quality and the implementation of the decisions made. As Ringold et al. (2011) say, this could be achieved by availing information through national-level legal frameworks and micro-level tools such as report cards to the citizens. This is to build public awareness of issues, to offer the public the chance to express their concerns and to allow public authorities to take care of such concerns (Groenfeldt, and Schmidt, 2013). This is a bit difficult because if the municipality organises meetings to provide relevant information and people do not attend; then it could mean that relevant information about the reasons behind the water interruptions and future developments could be missed out. This is key in the sense that, should the community have a clear understanding of the situations then maybe there would be fewer protest incidences. The information provided in the MLM reports was very informative, but one wonders if the information communicated by the municipality was firstly accessible to everyone and secondly if that information could have been available to the people in the language that they understand. According to the Municipal Systems Act, when municipalities give information about management, development, and governance, it is expected of them to take into account the different languages used in the region (South Africa, 2000). They must also think of the special needs of the people who cannot read and write (South Africa, 2000).

Some participants did not know where their water was coming from or the reasons behind the state of the water supply. The involvement and circulation of information might not mean getting consistent water supply into people's yards, but it is a step towards ensuring that people become better aware of the water situation in their region. Specifically, concerning combating protests, the suggestion from Morudu (2017) is that there needs to be more attention given to

the real issues of delivery of water to the people in the community rather than worrying about technical problems such as the number of connections or accounts registered with local municipalities. In a nutshell the first priority should be making sure that people will have access to basic consistent water supply. This is interesting because in the case of Moretele it looks as if the basic infrastructures such as pipes, taps, and reservoirs in certain areas have been put in place; the question is one of adequate and reliable bulk water supply. How this next step will progress depends on resolving the TWPP plant and the KWTP capacity.

5.5.3. Water developments require capital but from where?

“Section 213 of the Constitution, 1996, provides for the establishment of a National Revenue Fund. Section 214(1) (a) states that an Act of Parliament must provide for the equitable division of revenue that is raised annually amongst the national, provincial and local spheres of government. The purpose of these grants is to enable municipalities to provide basic services and perform the functions allocated to it (Section 227, Constitution, 1996)” (Oosthuizen and Thornhill 2017, p.4).

Most rural municipalities in South Africa depend entirely on National Treasury for financial support as they are unable to generate their own revenues. . Section 229 of the South African Constitution permits municipalities to generate revenues through collecting property taxes and extra charge for services such as waste collection, electricity, water, sanitation, and the usage of sport and recreational facilities. (Oosthuizen and Thornhill, 2017). MLM is not collecting any money from the public for the water that they get because, as explained, the water they supply to the community is not consistent to the point of expecting people to be paying for it. On the other hand in the MLM (2017), the primary sources of the municipality’s income comes from National Treasury grants (the primary source of revenue), property rates and municipal services.

Not getting enough volume of water from the TWPP was a big stumbling block, but the critical question was how MLM would deal with the issue of people paying for water once the water capacity is restored at TWPP. This is interesting

since currently, people are receiving their municipal water for free. According to Beyers (2016) and National Treasury (2011b), rural municipalities find it very hard to assume the responsibility of formulating revenue-generating strategies and adopting reliable budgets. The main reasons are adverse socioeconomic circumstances in their areas of jurisdiction and the unaffordability of tariffs for poor or over-indebted households (Beyers, 2016; SALGA, 2017). On the other hand, some participants pointed out that they would not mind if they had to pay for water since the people already pay for the water they collect from people with boreholes.

It could also be a problem on how the municipality should allocate the grant money if received, especially if the Treasury withholds their equitable share. Over the last couple of years, the National Treasury has withheld the equitable share for municipalities who have battled with settling their creditor debt with Eskom and water boards (PMG, 2015). Ordinarily, the equitable share is distributed unconditionally (Manuel, 1998). The funds empower municipalities with restricted resources to afford basic administrative and governance capacity and carry out essential municipal occupations (Reyneke, 2015). The provincial and local governments as the distinct domains of government control the right of way for these funds and should be accountable for the manners in which they are used (Manuel, 1998). In the instance of the MLM, the municipality in its rebuilding phase, upgrading its offices, therefore, it could be difficult for the grant money to be allocated to the different developmental departments. But of interest is that, according to the MLM (2017) as one of its subsidy grants, the DWA has allocated R62-million for the 2017/18 year with the grant set to increase to R74-million in 2018/19. The grant is specifically for municipal water infrastructure and said to contribute to the investment of water storages and reticulation projects. CoT municipality has also alluded to the fact that even though the MLM has problems with supplying its community with water, they have always been able to settle their water bills with them. This is a positive sign suggesting that amongst all the problems they face, they still manage to allocate the money they get from the government to their needy departments.

Another problem is that the municipality and the villages' proximity to Hammanskraal and Bela Bela mean that a significant portion of their residents' expenditure goes into the Gauteng and Limpopo provinces in regards to purchasing of services and not into the North West province. Jubilee Mall and Temba City Shopping Centre are both in Hammanskraal; they are the closest shopping centres for the southern parts of the Moretele region. In the case of the northern villages as other participants from Ngobi mentioned that they opt for Bela Bela rather than Hammanskraal to do their shopping because of its proximity. In a sense, the argument could be made that low order goods such as bulk groceries and other high order goods get bought outside the North West province.

5.5.4. Historic underinvestment in maintenance and upgrading of water infrastructure

Related to the challenge of 'slow rollout of service' mentioned earlier in this chapter are problems such as maintenance and upgrading of water infrastructure. In relation to political ecology, this is a challenge that has been echoed in the literature to affect the proper distribution of water in South Africa by scholars such as Smith (2002); Loftus (2009); Mothetha et al. (2013 and Petterson (2018). It is also not an exclusively rural or new phenomenon, as vividly expressed by Smith and Hanson (2003) in their description of water infrastructure in Langa, the oldest African township in Cape Town:

"These areas are visible sites of historical underinvestment in infrastructure as well as contemporary neglect of maintenance. Poor-quality infrastructure was initially installed in Langa in the 1930s to accommodate migrant workers. With very inexpensive rents, hostels were magnets for rural in-migrants and members of their families. The hostels have in-house water connections and waterborne sanitation facilities that are communally shared by the residents of the hostel unit. A 3-room unit can house from 4 to 30 people, all sharing a single toilet and water tap either within the hostel or outside the unit. The high density contributes to overuse of these resources and exacerbates the existing poor quality of the water

infrastructure. These issues were compounded by years of council neglect in maintenance, leading to a breakdown of infrastructure by the mid-1990s, characterised by burst mains and leaking pipes. Even though local authorities have initiated several upgrading projects since 1996, the high demands on water and sanitation facilities and insufficient council maintenance in these areas contribute to a state of infrastructure disrepair” (Smith and Hanson, 2003, p. 1525).

The underinvestment in water infrastructure and neglect of maintenance in Langa Township echoes the lack of up-to-date maintenance on the TWPP in Hammanskraal. Initially, the TWPP plant was meant to accommodate the surrounding townships like Temba and the white suburbs like Rens town in the years of apartheid. Over the years, the increase in demand from the surrounding villages on the outskirts of Hammanskraal in the Moretele region has meant that the capacity of the plant had to be increased to accommodate this situation. Bond, (2007) alludes to the fact that the rural areas in South Africa are underserved as a result of deficiencies in the operating grants.

Long years of apartheid forced those who had not been accessing water from the plant to obtain water mainly from groundwater. This was, of course, a structural injustice that prevented water resources from the TWPP plant to filter into the Moretele region. Things were different in Bophuthatswana during the Bantustan era when the only source of water access for the people did not include municipality treated water.

While the urban context is different from the rural Moretele context, Smith and Hanson (2003) highlight the concern that historically and racially unequal water access in Cape Town has been compounded by the abandonment of the maintenance of the infrastructure which has led the deterioration, resulting in the bursting of mains and leaking of pipes. CoT has said that on top of the increased demand for water from the growing surrounding villages, the additional problem is that the quality of water from the TWPP plant has continued to deteriorate over

the years. After the residents from Makapanstad complained about the poor quality of water that they were receiving from the plant. It has been confirmed that the plant has experienced a rise in the amount of pollution streaming into the Leeukraal dam which feeds the plant with raw water (Kgosana, 2018; CoT, n.d). It has been reported that poor quality of water related to TWPP has been caused by the water spillages from Rooiwal Waste Water Treatment Works entering the Apies River. CoT has reiterated that the reason for the water quality issue from the TWPP plant has been an increasing obstacle. This is part of the plan for the refurbishment of the plant which will also combat the poor quality of water that enters the plant in the future.

The plan was to make sure that the plant was in operation by 2018. But based on what was observed during my visit at the TWPP plant, the schedule was not close, and officials at the plant also confirmed this worry. Since the external reservoirs like the one in Makapanstad have not been in operation then how ready those reservoirs will be once the bulk water supply problems from the TWPP plant are solved is unclear.

As part of the network involved in the provision of water, the readiness of the plant is also vital to solving the problem of poor quality of the water delivered by trucks. This will mean that water will be distributed through pipes from the water plant into the external reservoirs or straight in the homes of the people. Some of the participants said that the truck water was filthy, but it is not clear whether the problem is with the truck water or from the water from the plant. Should all systems be right, then there should also be a cost cut as the trucks will no longer have to transport water. On the other side, the cost in the operation of the plant plus additional water treatment suppose the water in the plant will be increased.

5.6. A closer look at the governance of water

In relation to problems of water infrastructure, Ruiters and Matji (2015) point out that the water infrastructure problem could be because of both the water institutions and governance frameworks. As Swyngedouw (2009) indicates, we need to recognise how the infrastructural and the hydrological systematically link to the social, political and institutional at many levels. This section looks more closely at the administration of water in South Africa and into what the water guidelines say, and how both MLM and CoT have been fulfilling there. As it was highlighted in Bucknall et al. (2006) that there are many factors that good water governance relies on such as strong policy, approval and supervisory frameworks. The government policies play a significant role in how developments should follow suit in regards to achieving the goals of the South African constitution. The planning and execution at the local level in the North West province are not functioning at an optimum level. It was mentioned by the South African National Civic Organisation (Sanco) in 2018, that the lack of consequences for poor management is the main reason there has been a collapse in the service delivery in the North West province (Montsho, 2018). According to the South African Municipal Systems Act, 32 of 2000 under section 80, 1 (a), CoT as a municipality is also allowed to be the WSP for the MLM (Republic of South Africa, 2000). Even though CoT has been able to deliver on their responsibilities, the obligation to provide water to MLM can sometimes be much for them to shoulder in addition to their responsibility to communities within their jurisdiction. Therefore they have been in talks to allow MW to take the reins in the future, to be the WSP to MLM. This is in line with Section 78 of the Municipal Systems Act; the Act requires that each WSA – in this case, MLM – first assess whether it can initiate service provision by reorganising its management and producing the necessary human resource capacity (Republic of South Africa, 2000). The WSA is needed to consider structural issues, such as the cost-effectiveness of different provider options, performance benchmarks, and whether or not particular options are pro-poor.

Irrespective of whether CoT or MW are the WSP, the responsibility still lies with the WSA (in this instance MLM) to make sure that the local community has access to water (Republic of South Africa, 2000). In certain instances, MLM has come up with plans to ensure that its community gets water, e.g., Transactie plant and the refurbished public pumps in Ngobi and alternative temporary way of water access through trucks in the Makapanstad. But as a result of the evaluation in this research project, these establishments have not worked sufficiently to benefit the communities. The lack of sufficient water service in a couple of years in the Moretele region may be the reason why MW is planned to take over the future WSP duties.

5.7. Has water access made justifiable strides?

With regards to water access, we can see that there have been some inconsistencies in the balance between the policies and implementations by authorities. While it is fair to say that the democratic government has made some strides in an attempt to fix the past unjust service delivery in South Africa, many authors have captured how the system of injustices is still occurring in democratic South Africa regarding water service delivery (McDonald, 2002, Smith, 2002; Bond, 2009; Loftus, 2009).

According to Stats SA (2017), an average of 88.6% of the households in South Africa as of 2016 had access to piped water; however, provinces such as Limpopo (75.1%) and Eastern Cape (75.7%) this was slightly less. Nevertheless, there is a further 26.8% of households who access water on site, with 13.3% depending on communal taps and 2.4% access water from the taps of their neighbours. The composition of service delivery of water in the Moretele region has not changed significantly since the inception of democracy.

The results of the study have found there has been slow progress by the agencies of government in the form of the local municipality and the water service providers to provide water service to the people. Tracking all the examples in this study, the village Carousel View is the best-case scenario of water provision from MLM, receiving consistent bulk water supply into the people's yards and some villagers still complain about water interruptions. This is an additional issue that has also been highlighted in the other two villages, Makapanstad and Ngobi.

The problem is that people are not getting sufficiently reliable water supply, water access does not reach everyone, and in some cases, the water quality is poor. Therefore people end up looking for alternative ways to provide themselves with water. It is imperative to realise that even though the people in the rural areas might not have a high use of water as compared to people in the urban areas they still need access to water to sustain their lives. There were some of the people from the study who said that having a consistent water supply would enable them to improve their lifestyle livelihoods for example have gardens to grow their food. The 'right to water' is emphasised as human dignity not only applying to drinking for survival but water considered crucial for the production of food, for energy and cultural activities (Grunwald, 2016).

5.8. Political ecology of water access

Political ecology gives us the tools to understand that politics and power relations play a significant role in how resources are distributed in society. The problem of water in this study has been the struggle to keep the water in the TWPP plant clean and healthy for consumption but also the distribution of the water has been fixed to the point of being supplied on an interval basis. As policies have been the guidelines of how resources need to be suitably used to benefit people, the implementation of those policies has an obstacle. Since the late 1990s when plans were set through various policies to fix the mistakes of apartheid through fostering service delivery uneven progress has been made.

Political ecology also stresses that scarcity of resources is seldom natural, but often produced through social, economic and political processes in particular places and times. According to Karl Marx, in different types of society, the mode of production dominates and influences society by assigning ranks to them (Castree, 2015). As it was the case in South Africa under racial capitalism, the apartheid government gave first preference to the white minorities as opposed to the black majority regarding the distribution of resources. This differentiation was organized both by race and by space. The case of the Moretele region is a reference to the on-going struggle in the rural areas of South Africa where delivery of services, especially water, has been lopsided. In a sense, better water provision has and is still being given to the more developed settlements in the form of towns and townships with the rural and peri-urban areas considered last.

South Africa is facing physical and economic water scarcity (Mahlanza et al., 2016). In this research, the issue is more the economic water scarcity rather than the physical water scarcity. The allocation of water is to the sector of the society that can afford to pay for it at the expense of those who cannot pay for the water. The reservoirs in the Moretele region were said not to be working to access water from the TWPP, while on the other side the outside reservoirs such as the Babelegi and the Hammanskraal reservoirs were fully working. As a result, the TWPP primarily still accommodates areas close to the plant; the likes of Temba Township and Rens Town and that is why an area like Carousel View gets better water supply than the other villages in the Moretele region because of its proximity to the plant. As this is inequitable, the suggestion from Smith (2002) is that there has to be a closer inspection of the structures that regulate distribution. This study has pursued this in the Moretele area.

5.9. Analytical reflection

The purpose of this final section of the discussion is to look back critically on my experience of the research journey. In what follows, I reflect on the strengths and limitations of the study. The study, as a continuation from my honours project, initially focused on how the people of Makapanstad were accessing water and how the involved institutions played their part in providing the community with water access. My visit to MLM gave me a broader perspective of the water situation in the Moretele region. With a political ecology framework in mind to understand the dynamics at play and structural injustice within, I included the society in the form of three villages in the Moretele region and associated institutions in the way of MLM and CoT who are both acts as WSA and WSP respectively.

5.9.1. The choice to expand the project

The turning point of the research was after I had interviewed MLM; there I was enlightened of the scope of the water scene in the region. I was informed of the different modes of water access in the region; it then made sense to expand my research project by including two more villages in the region that received water differently from Makapanstad. This is how Carousel View and Ngobi were included in the study to enhance the depth and validity of the project. On top of the modes of water access I examined from Makapanstad then MLM informed me that Carousel View had the best case scenario of residents accessing reticulated water in the yard. MLM also told that Ngobi was one of the northern villages obtaining water from the boreholes set-ups. Once I decided that the project had slightly changed, the process of adjusting the methodology began.

Now with looking at the three villages with different water access characteristics, comparative analysis allowed me to look at the water situation in the Moretele region from several perspectives of the villages. I was able to understand that different parts of the Moretele region had different experiences of water access.

Through a multi-site case study, on top of the Makapanstad water access outlooks, I was able to integrate municipal groundwater supply (Ngobi) and a different perspective of reticulated treated water access in the yards of the communities in the form of Carousel View. The holistic nature of the study presented the results that showed differences in some cases while some showed similarities. These differences and similarities ranged from water modes, to type of settlements, the composition of the populations and the relationship the villages have with the municipality. I was able to understand that the water situation in the region has multiple layers that need careful assessment.

5.9.2. Different villages require different approaches

In the beginning, I stated that the village of Makapanstad is closer to the offices of MLM. Logistically this was the perfect setting as it is easily accessible. Coming from Johannesburg to the Hammanskraal complex I needed to catch only one taxi to get to Makapanstad and the same could be said about Carousel View. On the other hand, the village of Ngobi which is more than 60km away from Hammanskraal meant that a different approach was needed when going there for data collection. Makapanstad by virtue of having previous knowledge of the area made it easy to navigate around and to plan strategically. For Carousel View and Ngobi since it was my first time visiting them, on occasions I had to rely on people's guidance of the place during the interviews with participants. Ngobi because of the distance and isolation required a lot of strategies. Firstly, it was expensive to get there which meant going there I had to be there early and spend the whole day, unlike the other two villages where I would decide to do the data collection in the afternoon because of the hot conditions.

As much as semi-structured interviews could allow openness and the bringing of new perspectives, based on the experience of the honours project, it consumed time with the participants discussing unrelated topics. The plan when approaching participants from places like Carousel View and Ngobi was that the first person I

talk to from the villages would be asked to give me an informative background of the place including the sections and water situation. Once I had a clear understanding of this, then I would be able to plan which section I will start with and how many people I would interview from there. Makapanstad, as I had previous knowledge of it, set the tone on how I should approach the participants for other places. Importantly it was also important to make sure that you enter the yard of the participant with the certainty of not putting yourself in danger, with dogs for example. Once you enter the yard of the participant, I would greet and explain my intention with the research, then this will soften the next stage of reading the information sheet as they would already have got some of the guidelines from my introduction. Then importantly you would not want to sound judgemental during the interview as the aim of this is to get the participants perspectives and not the other way round.

5.9.3. Chasing the related institutions

Doing institutional analysis was key as it provided the other side of the story apart from the perspective of the participants from the villages and the documents analysis. I was afforded the opportunity to explore the dynamics of the institutions and functions of the officials in respect to how they provide water.

However, data collection with the institutions was not as flexible as it was from the villages whereby in the institutions the participants are limited and their availability depends on prearrangements. The advisable thing was to leave enough time for the interviews with the institutions as the prearranged meetings were sometimes postponed. It can also happen that once you are allowed access to do data collection with the institutions then unexpected crucial information could emerge which would have an impact on the composition of the sample. Doors to other related sample groups were opened; hence the use of snowball sampling. Because of the limited time and institutions also being unknown entities, I had to apply a semi-structured interview approach and audio recording in some cases.

Approaching the institutions was a bit challenging at the beginning because of the university's requirement for institutional permission before doing data collection with them. Additionally, in some cases, I was not sure which institutions were the right ones to approach until I got there. In the beginning, I had three institutions to interview; MLM, BPDM and MW. Once I got to MLM, it was when things started to open up as I had to drop the other two institutions and add CoT in place of them. The problem was that I now had to go through the permission process again to add CoT at the expense of BPDM and MW. At CoT, I got told fascinating stories that MW will be the future WSP. Then the thinking was that now this will be the perfect ending to the research in the sequence of the water journey in the Moretele region. However, after going through the ethics process again to endorse MW as an additional institution, MW participants were difficult to pin down and hence not included in the research.

Logistically, MLM being opposite Mathibestad which is adjacent to Makapanstad made it easy to get there because of my familiarity with Makapanstad. On the other hand, CoT was in the Pretoria central business district (CBD) which meant I had to familiarise myself with the place through Google Maps before I got there. For early meetings to get to Pretoria from Johannesburg, I had to make it a point to catch transport as early as possible to avoid traffic.

5.9.4. Journey to remember

All in all, this was an exciting journey as with every change that happened, I made sure that I stuck to my research timeline. Of course, dates had to be tweaked a bit from the original plans. With every change, the research timeline was also adjusted to give me a reference to prioritising the tasks equally. This has resulted in me pushing myself harder to produce ahead of schedule to leave time for unforeseen circumstances along the way.

5.10. Conclusion

In the first half of the discussion, the results of the research showed associated differences and similarities of water access across the three villages. These characteristics were compared and contrasted to explore the linkages which revealed a lot about historic water modes, size and proximity of the villages. In the second part of the discussion when integrating the results with the literature and the concept of governance and the political ecology framework, it was confirmed that the challenges around water access in the Moretele region have multiple layers. The dynamics include accountability, lack of public participation and engagement, underinvestment in maintenance and upgrading of water infrastructure. The issue of the TWPP taking more than 20 years to be fully in operation to accommodate the villages in the Moretele region is problematic. This falls under the category of underinvestment in maintenance and upgrading of water infrastructure. The development of TWPP has taken a long time to solve the main problem of capacity to ensure that the water from the plant not only accommodates supply to MLM but also that the quality of the water is improved.

Overall looking at the results of the study, evaluating the dynamics shaping water access is that the local government has failed to administer water access evenly across Moretele region. The basis of this conclusion is the accounts of the communities together with those of the institutions regarding the current and historical water scenario. This scenario looks unsatisfactory thus far for the majority of the villages to have a consistent water supply. The failure has many layers that include past and current structural injustices. Political ecology has given us a guideline to understanding how power relations are key in shaping how resources are distributed unequally. In the Moretele case, it was the more urban settlement of Carousel View that has received the most attention in terms of water services, through both its proximity to an established reservoir connected to the water plant (Babelegi reservoir) and also its proximity to other urban places like Temba and Rens Town that have been more important to local government historically than its rural constituents. How future investments in the bulk water

supply system will change those uneven connections going forward will be interesting to investigate in the future.

Chapter 6: Conclusion

This comparative study of the three Moretele villages informed by a political ecology and water governance approach highlight the slow and uneven progress when it comes to the provision of water in more peri-urban and rural areas, and particularly how these are shaped by dynamics around bulk water supply. The study finds that while there have been attempts by the state to improve water access in the region, those places closest to the historically advantaged urban areas and sites of infrastructural investment, such as Carousel View, have seen greater improvements in water access than those in more remote areas. To make up for a reliable and quality supply, residents continue to use a range of water sourcing methods.

The first part of this concluding chapter revisits the aims and the objectives of the research, its guiding literature and methodological approach. In the second part of the conclusion, I highlight the main arguments and contribution of the research, in relation to a wider body of scholarship on post-apartheid water provision. In the final section, I propose avenues for future studies, particularly

6.1. Summary of research objectives and research undertaken

My honours project concluded that people in Makapanstad were not getting adequate water access, therefore in my master's project I undertook a wider multi-site case study aimed at finding out what are the dynamics that shape the access of water in the Moretele region as a whole. The understanding was informed by a wider reading of literature around water access and supply. The literature covered how the legacy of apartheid created the uneven provision of water in South Africa and how the unequal provision of water is still occurring in current South Africa. Following the legacy of apartheid, the focus was now on how the water landscape was restructured by policies such as RDP and GEAR in the 1990s. In that regard phases of privatisation and FBW in post-apartheid were covered. There was also

literature on the roles and responsibilities of water institutions and the concept of water governance. Lastly, political ecology as an approach was used to understand water dynamics in South Africa in a way that considered the interrelation between the ecological, the institutional, the social and the political.

My research was organized around three objectives. The first objective was, to understand from the three selected villages in the region (Makapanstad, Ngobi and Carousel View) how they experienced water access. This was followed by examining the relevant water institutions how they were playing their roles in ensuring that water gets provided the communities. This also provided an understanding of the water networks involved between the related parties.

To meet these objectives, my fieldwork included conducting structured interviews with the participants from the villages and semi-structured interviews with the participants from the related institutions. Observation was also used as a tool to corroborate the interview data. The interviews and observations were supported by the document review, where relevant documents were used to comprehend the context of the water situation in this research to strengthen the validity of the study.

6.2. Summary of main arguments and contribution to the literature

The research contributes to the body of literature on water access in the global South and South Africa and the challenges of water governance and equal provisioning. The general water access statistics can be lopsided, telling different stories at the macro and micro level. In the literature, it was said that South Africa had 88.6% of households with piped water by 2017. The problem was that when you look at other provinces average, such as the Eastern Cape (74.7%) and Limpopo (74.2%), they did not enjoy that much success. Of course, we should not take anything away from the strides which have been made by the democratic

government in South Africa of water provision. At the dawn of democracy, there was a huge backlog of about 30% of the population which was in dire need of adequate water supply while 50% was also requiring adequate sanitation (Nnadozie 2011). However, scholars such as Smith (2002) and Loftus (2009) argue that the legacy of structural injustice continues in South Africa although during apartheid inequality of resources was determined by 'race' and in democratic South Africa the inequality of resources operate through 'class', and its relationship to race.

The study revealed a number of issues or dynamics which have shaped these uneven dynamics and prolonged the improvement of water access in the wider Moretele region. One of the key issues in this regard has been the historical underinvestment in maintenance and belated upgrading of water infrastructure such as the TWPP. This has been faced by a set of challenges, including the lack of capacity to produce enough water to accommodate MLM and the poor quality of water coming from the plant. The plant problems have multiplied into many issues affecting the end users resulting in interval access to water, 'dirty' water, and water transportation of water through trucks for the middle to south communities like Makapanstad.

Other kinds of infrastructure investment in the northern region, namely the Transactie water plant and the refurbished public pumps, have been positive but have not benefited everyone. In the village of Ngobi, none of the participants mentioned getting water from the Transactie water plant. The refurbished public pumps could only be accessed by the people close to them through self-connecting pipes into their yards. The rest of the people who cannot get access to water through all the government water installations are heavily dependent on groundwater in the form of boreholes and wells in some villages. These become more unreliable in times of drought when the water table drops, or when access is controlled by someone who owns the borehole.

There was a lack of synergy between the community and MLM; the communications lines are not functioning well and some of the people in the villages seem to be less aware of the nature of the water situation. Engagement the ward councillors would have better established where the lack of accountability is. From my research participants, MLM spoke about the communities showing a lack of interest in the organised meetings. On the other hand, some of the community members said that MLM was not informing them of the changes that happen such as water cuts. The importance of communication in this regard is that if it was effectively used then issues, such protests could have been prevented, or at least the slow progress explained.

The administration of water from the institutions (MLM and CoT) may have looked less urgent in their performance, but there were no signs of mismanagement of resources that I was privy to. In the case of Makapanstad, people accessed the groundwater that MLM considered to have high levels of sodium, but the municipality was in a difficult situation because there was no alternative to boreholes. Now more than ever, the urgency of water supply from the TWPP is very high, but the urgency has been there for a while now based on the results of the study. The promise from CoT was that the construction from the plant would be completed by 2018 with additional capacity of 120Ml. MW is set to be involved in the water provision duties in this regard. A solid productive ethic is needed through the guidelines of good governance to ensure that Moretele region does have stable and reliable modes of water access.

6.3. Recommendations for further research

Building on this research study, future studies could look at the transition from CoT to MW as the WSP through the Magalies Water Bulk Water Supply System project (if it happens) regarding the provision of water to the Moretele region. This transition is said to occur once the constructions at TWPP and KWTP are

completed to provide enough water to the Moretele region. It would be interesting to look at the dynamics involved and see how the access/supply have changed or remained the same. How this will change the pricing and tariffs of water will also be important to investigate. Furthermore, based on this study, the future water supply from the TWPP and KWTP would not urgently accommodate the northern villages, how those villages will be included needs investigation.

The study focused on case studies of a rural and peri-urban nature. It would add value to the comparative analysis of the uneven distribution of water in South Africa by including other types of more urban settlements in and around Hammanskraal. In this regard, the addition of a township like Temba and suburban area like Rens Town, also dependent on the TWPP, would provide an interesting extension.

Additional villages' water access in the Moretele region could also be investigated. For example, a follow-up study could include other areas close to the TWPP such as Danhouse to see if such villages in the Moretele region also have access to reticulated water in the same manner as Carousel View. Danhouse is on the same pipeline as Makapanstad, but closer only 9km from TWPP. The CoT officials said that water in this direction is supplied from TWPP through the pipes straight into the yards of the people in the (south and middle) Moretele. This would mean that Danhouse would be getting a similar supply of water as Carousel View which is also 9km of the TWPP. Since Carousel View is also getting water supply from the KWTP on top of the TWPP supply, then knowing how much water supply Danhouse gets could give us a sense of whether the Carousel View was really getting sufficient water from TWPP or was it mainly from the KWTP. Exploring this deeper would then tell a different story to what this study has concluded concerning TWPP and Carousel View. This could either say that Carousel View is not the only village within MLM that receives reasonable water from TWPP or this could mean that none of the villages in the region get consistent water supply from the TWPP.

Finally, the water dynamics in the region could be further explored by the inclusion of another northern village that gets access to water from the Transactie reservoirs plant for a better overall assessment of the plant. None of the interviewed participants from Ngobi mentioned accessing water from Transactie reservoirs. Based on the fact the plant was not accommodative to Ngobi then we could see how many more villages have similar experiences to Ngobi. This will urgently make a case for the inclusion of the northern villages in the plans of the Magalies Water Bulk Water Supply System project. On the other side, the inclusion of other villages will grant us the opportunity to see the success of the Transactie reservoirs plan in the other villages in which it serves their communities well and how the system could be improved to work for villages such as Ngobi optimally.

6.4. Conclusion

The Moretele region has provided an interesting example of the tensions around post-apartheid water service delivery. There is evidence that since the dawn of democracy there have been initiatives which have been carried out by the MLM in ensuring the realisation of basic water access. On the other hand, there have been slow signs of progress on the implementation of the projects which would bring a better level of water access in the region. A multi-site, comparative approach and a political ecology-informed analysis is attentive to these differentiations and their interrelations with each other. Different places have had quite different experiences, despite falling within the same municipality's jurisdiction, demonstrating the legacy of uneven development and place-specific challenges (such as the levels of salt in the groundwater, the types of soil, the distance from infrastructure, different levels of state and private investment, etc.). People strategies work-around to deal with these uneven provisioning in their daily lives.

Chapter 7: References

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Chapter 8: Appendices

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8.1. Appendix of data collection instruments for village participants

Participant Information sheet for the residents of Makapanstad/ Carousel View/ Ngobi

Good day

My name is Motshwaedi Sepeng a master's student from the University of the Witwatersrand (School of Geography, Archaeology and Environmental Studies). As part of my course, I am undertaking a research study that aims to examine the dynamics shaping water access for rural and peri-urban areas in the region of Moretele, North West Province, South Africa. Therefore I will need to document how water access is occurring in Makapanstad/ Carousel View/ Ngobi.

As a Makapanstad/ Carousel View/ Ngobi resident you are invited to participate in the study. Participation in the study will consist of partaking in an interview and with your permission, accompanying you to places where you access water. The interview will take approximately 30 minutes, either at your home or in a venue of your choosing. You will be asked questions about (1) how water is accessed in Makapanstad/ Carousel View/ Ngobi and (2) how you access to water for your household needs.

With your permission, you are being asked for photographs to be taken of your water points. While this could potentially identify your household, I will not take any photographs of faces or easily identifiable features (such as the outside of your house). You will be participating in the research study voluntarily. There are no anticipated risks or benefits for your participation in the study and you have the right to withdraw from the study without any penalty. You are allowed to answer any or all the questions you want. You also have the right to ask questions about the research and have them answered to their satisfaction.

The final report will not relate any information with your name and address in terms of anonymity. The collected information will be kept confidential whereby it will not be directly traced back to you. In terms of confidentiality, the collected information will be kept safe where only I will have access to it. After the research is completed, the collected information will be kept in the password protected cloud storage as the information could be useful to my future studies in the area of water access. The final study will be available in the Wits library and in the online thesis repository. I may also share the research findings at a conference or in an academic article.

Any questions related to the study could be directed to me or the supervisor on the contact details below.

Yours sincerely

Motshwaedi Sepeng

Researcher contact: (Motshwaedi Sepeng, 0724384916, 419847@students.wits.ac.za)

Supervisor contact: (Dr Siân Butcher, +27 11 717 6573, sian.butcher@wits.ac.za)

Makapanstad/ Carousel View/ Ngobi residents' interview

Moretele villages

1. Biography

1.1. Gender Male Female

1.2. Age group 19- 26 27-39 40+

1.3. How long have you been living in Makapanstad/ Carousel View/ Ngobi?

.....

2. Water collection

2.1.Can you talk to me about the type of source you mainly get your water from
and how long does it take you to get there?

.....

2.2.Do you pay for your water and if so how much?

.....

2.3.Tell me who collects water in the house and usually what time of the day is
the water collected?

.....

2.4.How many individuals depend on the water you access?

.....

2.5.How much water is obtained to be enough for you and your family?

.....

2.6.What you usually use the water for?

.....

2.7.Are you happy with the kind of water sources you get your water from?
.....

2.8.Which manner of water access do you think will best to accommodate your needs and why?
.....

2.9.How do you think this best manner of accessing water could be fully achieved?
.....

3. History of water access in Makapanstad/ Carousel View/ Ngobi over the years since democracy.

3.1.Tell me how have you been accessing water over the years?
1994-1999
.....

2000-2005
.....

2006-2010
.....

2011-2017
.....

3.1.During these periods, which period was easier to access water and which period was difficult?
.....

4. How do other people in the village get access to water?

4.1 In your own opinion, what is the common water source that people in the village use?

.....

4.2 And what other kinds of water sources do people in the village use?

.....

4.3 Do you know if people in the village have reticulated water in their yards and is water always available from those taps?

.....

4.4 In your own opinion, where do you think your government water comes from?

.....

5. People with boreholes

5.1 What is the reason for having borehole water?

.....

5.2 How long have you been using borehole water?

.....

5.3 Are you satisfied with the quality and quantity of the water you get from borehole?

.....

5.4 How much did it cost to install a borehole?

.....

6. Problems related to water access in the community

6.1 Do you see water access as a problem in the community?

.....

6.2 Can you explain the extent of the water problem?

.....

6.3 How do you and other residents address the problem of water?

.....

6.4 As a resident of Makapanstad/ Carousel View/ Ngobi, how would you like to see the problem of water resolved?

.....

7. Impact of the availability of water access in the community

7.1 How has the mode of accessing water impacted on your freedom to use water for your activities?

.....

7.1 When water is not available to you what actions do you take to make sure you have access to water?

.....

8. The relationship with the municipality about water access

8.1 I will like to know from you how does the municipality communicate with the community about water access?

.....

8.1 In your opinion how do you think the municipality can improve their relationship with you about water access?

.....

8.2. Appendix of data collection instruments for institutional participants

Participant Information sheet for Moretele Local Municipality

Good day

My name is Motshwaedi Sepeng a Master's student from the University of the Witwatersrand (School of Geography, Archaeology and Environmental Studies). As part of my course, I am undertaking a research study to examine the dynamics shaping water access for rural and peri-urban areas in the region of Moretele, North West Province, South Africa. It will be important to understand how the Moretele Local Municipality undertakes the service of water in the Moretele region. The Moretele Local Municipality has given me permission to conduct this study.

You are invited to participate in the study as an involved stakeholder in water provisioning to Makapanstad. Participation in the study will consist of partaking in an interview about (1) how does water supply occur from the side of the Moretele Local Municipality towards the community of Makapanstad. (2) How is the relationship between you, your water suppliers and the Makapanstad community? You are asked to be audio recorded during the interview and the audio recording will be deleted after it has been transcribed. Also, neither your name nor any other identifying information about you will be recorded. If you feel uncomfortable with being recorded, then your responses will only be handwritten and not recorded. The interview will take approximately 30-45 minutes, either at your offices or in a venue of your choosing. You will be participating in the research study voluntarily. There are no anticipated risks or benefits for your participation in the study and you have the right to withdraw from the study without any penalty. You are allowed to answer any or all the questions you want. You also have the right to ask questions about the research and have them answered to their satisfaction.

The final report will not relate any information with the name and address of the participants in terms of anonymity. But given the position of the participants in a public institution it might be difficult to guarantee anonymity. In terms of confidentiality, the collected information will be kept safe where only I will have access to it. After the research is completed, the collected information will be kept in the password protected cloud storage as the information could be useful to my future studies in the area of water access. The final study will be available in the Wits library and in the online thesis repository. I may also share the research findings at a conference or in an academic article.

Any questions related to the study could be directed to me or the supervisor on the contact details below.

Yours sincerely

Motshwaedi Sepeng

Researcher contact: (Motshwaedi Sepeng, 0724384916, 419847@students.wits.ac.za)

Supervisor contact: (Dr Siân Butcher, +27 11 717 6573, sian.butcher@wits.ac.za)

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Consent Form for the Moretele Local Municipality

Research Title: Examining the dynamics shaping water access for the region of Moretele

I agree that the study researcher Mr. Motshwaedi Sepeng has informed me of the nature, manner, risks, aim and benefits of the study. Therefore I agree to be part of the research study.

YES NO (please circle)

I understand that my participation will be voluntary, I am allowed to answer any question I want and I can withdraw from the interview at any time without penalty.

YES NO

I understand that I have a chance to ask any questions I have about this research and have them answered to my satisfaction.

YES NO

I was provided with the information sheet (which has detailed information about the research) and I have read and understood it.

YES NO

I agree that I will talk to you about how the Moretele Local Municipality undertakes the service of water in the community of Makapanstad and talk about our relationship with the water suppliers.

YES NO

I am aware and agree that the published result of the study will be kept confidential by the researcher but since I am a public figure there are chances that confidentiality might not be guaranteed.

YES NO

I understand and agree that the collected information from me will not be destroyed and will be kept in password protected cloud storage to be used for future research as long as is in line with the research confidentiality and anonymity policy.

YES NO

I am aware that the audio recording will be destroyed after the interviewer has transcribed the recording.

YES NO

I am aware that my identity will be not be recorded and revealed in the audio.

YES NO

After reading and understanding the requirements for recording this interview, therefore I like

To be audio reordered during this interview
recorded during this interview

Not to be audio

PARTICIPANT

Signature

Date

I, Motshwaedi Sepeng, I therefore, confirm that the above participant has been fully informed about nature, manner, risks, aim and benefits of the study.

Moretele Local Municipality interview questions

- 1.1. Can talk of the role of the Moretele Local Municipality (MLM) in the provision of water to the communities in the Moretele?
- 1.2. Who are the other involved stakeholders in the provision of water?
- 1.3. Until the water is supplied to the residents, can you explain the linkages and processes involved at the different stages?

Sources of funding the water

- 2.1. Can you tell me how the water service is funded?

Water supply to the community

- 3.1. What type of modes does the municipality supply water to the different communities in the Moretele region?
- 3.2. Are the residents paying for the water they are receiving, if so how much if not why not?
- 3.3. What are the guidelines used to establish the provision of water in the communities?
- 3.4. How are decisions reached when it comes to how people should be provided with water? Who is in charge of that decision?
- 3.5. Do you take into account what the people are using the water for?
- 3.6. Do you take into account how long the people walk to get their water?

3.7. What challenges do you have in making sure that water gets supplied to the people?

Relationship with the community

4.1. What kind of relationship do you have with the communities about water supply/access?

4.2. What channels are in place between you and the community regarding the water supply?

Relationship with other water stakeholders

5.1. What kinds of relationships do you have with the City of Tshwane (CoT) in regards to the supply of water to the community?

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Participant Information sheet for the City of Tshwane

Good day

My name is Motshwaedi Sepeng, a Master's student from the University of the Witwatersrand (School of Geography, Archaeology and Environmental Studies). As part of my course, I am undertaking a research study to examine the dynamics shaping water access for rural and peri-urban areas in the region of Moretele, North West Province, South Africa. Therefore I am interested to explore how the City of Tshwane view and play their role in mandating water supply in this regard. The City of Tshwane has given me permission to conduct this study.

You are invited to participate in the study as an involved stakeholder in water provisioning to the Moretele Local Municipality. Participation in the study will consist of partaking in an interview about (1) what ensuring water access entails from the City of Tshwane (2), what is their association in providing water to the Moretele Local Municipality and eventually to the residents in the region (3) and allowed to take photos of the water infrastructure. The interview will take approximately 30-45minutes, either at your offices or in a venue of your choosing. You are asked to be audio recorded during the interview and the audio recording will be deleted after it has been transcribed. Also, neither your name nor any other identifying information about you will be recorded. If you feel uncomfortable with being recorded, then your responses will only be handwritten and not recorded. You will be participating in the research study voluntarily. There are no anticipated risks or benefits for your participation in the study and you have the right to withdraw from the study without any penalty. You are allowed to answer any or all the questions you want. You also have the right to ask questions about the research and have them answered to satisfaction.

The final report will not relate any information with the name and address of the participants in terms of anonymity. But given the position of the participants in a public institution it might be difficult to guarantee anonymity. In terms of confidentiality, the collected information will be kept safe where only I will have access to it. After the research is completed, the collected information will be kept in the password protected cloud storage as the information could be useful to my future studies in the area of water access. The final study will be available in the Wits library and in the online thesis repository. I may also share the research findings at a conference or in an academic article.

Any questions related to the study could be directed to me or the supervisor on the contact details below.

Yours sincerely

Motshwaedi Sepeng

Researcher contact: (Motshwaedi Sepeng, 0724384916, 419847@students.wits.ac.za)

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Consent Form for the City of Tshwane

Research Title: Examining the dynamics shaping water access for the region of Moretele

I agree that the study researcher: Mr. Motshwaedi Sepeng has informed me of the nature, manner, risks, aim and benefits of the study. Therefore I agree to be part of the research study.

YES NO (please circle)

I understand that my participation will be voluntary, I am allowed to answer any question I want and I can withdraw from the interview at any time without penalty.

YES NO

I understand that I have a chance to ask any questions I have about this research and have them answered to my satisfaction.

YES NO

I was provided with the information sheet (which has detailed information about the research) and I have read and understood it.

YES NO

I agree that I will talk to you about how the City of Tshwane view and play their role in mandating water supply to the Moretele Local Municipality and eventually to the communities in the region.

YES NO

I understand and agree that the collected information from me will not be destroyed and will be kept in password protected cloud storage to be used for

future research as long as is in line with the research confidentiality and anonymity policy.

YES NO

I am aware that the audio recording will be destroyed after the interviewer has transcribed the recording.

YES NO

I am aware that my identity will be not be recorded and revealed in the audio.

YES NO

After reading and understanding the requirements for recording this interview, therefore I like

To be audio reordered during this interview
recorded during this interview

Not to be audio

PARTICIPANT

Signature

Date

I, Motshwaedi Sepeng, I therefore, confirm that the above participant has been fully informed about nature, manner, risks, aim and benefits of the study.

City of Tshwane

The City of Tshwane interview questions

1. What is the role of the City of Tshwane Municipality (CoT) in providing water to the Moretele Local Municipality (MLM)?

.....

2. What propelled the CoT in supplying MLM with water and not a supplier from the North West province as MLM is a local municipality in the North West province?

.....

3. What are the roles of the other involved stakeholders in the supply of water to the Moretele region?

.....

4. What are your water sources and is the water received by CoT enough to cover all your customers?

.....

5. What are the basic sequences involved from the water source(s) into the Temba Water Purification Plant (TWPP) until the water is supplied to the MLM?

.....

6. What challenges do you have regarding the capacity, quality and distribution of water?

.....

7. What does sufficient water access mean to the CoT and what plans do they have to provide adequate water to the communities?

.....

8. Is the mode in which people are currently supplied with water in accordance with the guidelines of the Water Act?

.....

9. What are plans do you have in providing MLM with sufficient water in the future?

.....

10. When will the TWPP be completed and what follow up procedures are in place to ensure proper water access to the communities in the Moretele region?

.....

11. What propelled the CoT in providing MLM with water and not a provider from the North West province as MLM falls under the North West province?

.....

12. Klipdrift water supply

.....

13. What is CoT involvement of the Klipdrift water project and how will that affect MLM?

.....

14. When will the Klipdrift water project by completed to provide adequate water to the Moretele communities?

.....

8.3. Appendix of ethics approval documents

Research ethics permission certificate



Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Sepeng

CLEARANCE CERTIFICATE

PROTOCOL NUMBER: H17/08/32

PROJECT TITLE

Examining the dynamics shaping water access for the community of Makapanstad

INVESTIGATOR(S)

Mr M Sepeng

SCHOOL/DEPARTMENT

Geography, Archaeology and Environmental Studies/

DATE CONSIDERED

18 August 2017

DECISION OF THE COMMITTEE

Approved

EXPIRY DATE

13 September 2020

DATE

14 September 2017

CHAIRPERSON


(Professor J Knight)

cc: Supervisor : Dr S Butcher

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**


Signature

04/12/2017
Date

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES